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Table of Contents

0. EXECUTIVE SUMMARY	4
1. GENERAL OUTLINE	8
1.1. THE PROJECT	8
1.1.1. THE CONTRIBUTION TO EUROPEANA	8
1.1.2. TARGETING BEST PRACTICES ALONG THE DIGITISATION TRAJECTORY	9
1.2. THE CONSORTIUM	12
1.3. THE TARGETED OBJECTIVES	13
1.4. EXPECTED IMPACT	15
2. IMPLEMENTATION PROCESS	17
2.1. ASSESSING THE STATUS QUO	17
2.2. ESTABLISHING THE DIGITISATION WORKFLOW	19
2.3. SHARING KNOWLEDGE AND BEST PRACTICES	20
2.3.1. GETTING STARTED ON THE DIGITISATION	20
2.3.2. METADATA IMPLEMENTATION	23
2.3.3. LONG-TERM PRESERVATION	26
2.4. FROM DIGITISATION TO AGGREGATION	27
2.4.1. <i>EUROPEANA</i> AND AGGREGATORS	27
2.4.2. CREATING AN EXPORT FOR <i>EUROPEANA</i>	30
2.4.3. AGGREGATION AND INGESTION TRAJECTORY	34
2.4.4. LEGAL ISSUES	35
3. TOWARDS ENHANCED QUERY RESULTS	37
4. SUPPORTING TOOLS	39
4.1. DIGITISATION PLAN	39
4.2. PROGRESS MONITORING TOOLS AND QUALITY SPECIFICATION CONTROL	40
4.3. THE MINT TOOL AND TUTORIAL	42
4.4. THE SCORE MODEL FOR DIGITAL SUSTAINABILITY	44
5. ACHIEVED RESULTS	46
5.1. AGGREGATED CONTENT	46
5.2. DOCUMENTATION	48
5.2.1. PUBLISHED GUIDELINES	48
5.2.2. CASE STUDIES AND INTERVIEWS	51
6. BASIS FOR SUSTAINABILITY OF RESULTS	53
6.1. INGESTION OF CONTENT UPDATES	53
6.2. LIVING DOCUMENT OF GUIDELINES	54
6.3. SOCIO-ECONOMIC IMPACT AND THE WIDER SOCIETAL IMPLICATIONS OF THE PROJECT	55
7. DISSEMINATION OF THE PROJECT	58
7.1. IDENTIFICATION OF THE TARGET USERS	58
7.2. GENERAL DISSEMINATION STRATEGY	59
7.3. DISSEMINATION TOOLKIT	59
7.4. DISSEMINATION ACTIVITIES AND COMMUNICATION CHANNELS	60

0. Executive summary

The final report is intended for public distribution and comprises a comprehensive summary of results, conclusions and the socio-economic impacts of the project “Digitising Contemporary Art”, a project co-funded by the European Commission within the ICT Policy Support Programme.

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¹ At the beginning of the DCA project on 1 January 2011 IMINDS was still called IBBT.

Content partners

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6	RAM	REYKJAVIK ART MUSEUM	Iceland (Reykjavik)	http://www.artmuseum.is	- general: listasafn@reykjavik.is - Bryndis Hjalmarsdottir (head of collections): Bryndis.Erla.Hjalmarsdottir@reykjavik.is
7	MMSU	MUSEUM OF MODERN AND CONTEMPORART ART	Croatia (Rijeka)	http://www.mmsu.hr	- general: mmsu-rijeka@ri.t-com.hr - Diana Zrilić (documentarist): diana.zrilic@mmsu.hr
8	MODERNA GALERIJA	MUSEUM OF MODERN ART	Slovenia (Ljubljana)	http://www.mg-lj.si	- general: info@mg-lj.si - Zdenka Badovinac (director): info@mg-lj.si
9	EPMAS	NATIONAL GALLERY-ALEXANDROS SOUTZOS MUSEUM	Greece (Athens)	http://www.nationalgallery.gr	- Marina Lambraki-Plaka (director): marinamakri@nationalgallery.gr
10	ARGOS	ARGOS - CENTRE FOR ART AND MEDIA	Belgium (Brussels)	http://www.argosarts.org	- general: info@argosarts.org - media library: medialibrary@argosarts.org - Rolf Quaghebeur (general director): rolf@argosarts.org
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12	LIMA ²	LIMA	The Netherlands (Amsterdam)	http://www.li-ma.nl	- general: info@li-ma.nl - Gaby Wijers (director): gabywijers@li-ma.nl
13	FTAPIES	ANTONI TAPIES FOUNDATION	Spain (Barcelona)	http://www.fundaciotapies.org	- Laurence Rassel (director): lrassel@ftapies.com
14	AE	ARS ELECTRONICA	Austria (Linz)	http://www.aec.at	- general: info@aec.at - Gerfried Stocker (director): gerfried.stocker@aec.at

² LIMA replaces since 1 January 2013 NIMK - Netherlands Institute for Media Art (Amsterdam, The Netherlands).

15	MRBAB-KMSKB	ROYAL MUSEUMS OF FINE ARTS OF BELGIUM	Belgium (Brussels)	http://www.fine-arts-museum.be	- general: info@fine-arts-museum.be - Pierre-Yves Desaiwe (head of digital museum): fabritius@fine-arts-museum.be
16	HFG	KARLSRUHE UNIVERSITY OF ARTS AND DESIGN	Germany (Karlsruhe)	http://www.hfg-karlsruhe.de	- Uwe Hochmuth (prorector): uhochmuth@hfg-karlsruhe.de
17	WRO	WRO ART CENTER	Poland (Wroclaw)	http://www.wrocenter.pl	- general: info@wrocenter.pl - Violetta Kutlubasis-Krajewska (director of the foundation): info@wrocenter.pl
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19	MBVB	MUSEUM BOIJMANS VAN BEUNINGEN	The Netherlands (Rotterdam)	http://www.boijmans.nl/	- general: info@boijmans.nl - Nynke van der Wal (head of documentation centre): wal@boijmans.nl
20	MAC	MUSEUM OF CONTEMPORARY ARTS OF THE FRENCH COMMUNITY OF BELGIUM	Belgium (Grand-Hornu)	http://www.mac-s.be	- general: info.macs@grand-hornu.be - Laurent Busine (director): info.macs@grand-hornu.be
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23	LCCA	LATVIAN CENTRE FOR CONTEMPORARY ART	Latvia (Riga)	http://www.lcca.lv	- Solvita Krese (director): skrese@lcca.lv
24	MU.ZEE	MU.ZEE, KUNSTMUSEUM AAN ZEE	Belgium (Ostend)	http://www.muzee.be	- general: info@muzee.be - Phillip Van den Bossche (director): info@muzee.be
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1. General outline

1.1. The project

Digitising Contemporary Art (DCA) was a 30-month pilot B project designed to create a body of high-quality digital reproductions of artworks and contextual documents from European collections of contemporary art, to be made accessible through *Europeana*. The category 'contemporary art' refers to the art historic period after 1945. With 25,130 records harvested by *Europeana*, DCA provided a significant corpus of key contemporary artworks and contextual documents, a type of cultural heritage that was still largely missing in *Europeana*. Beyond providing this important content, DCA positioned itself as a collaborative project for the development, application and dissemination of best practices.

1.1.1. The contribution to Europeana

The digital reproductions created during the course of the project are now accessible and retrievable through *Europeana*. They cover a wide range of artworks (e.g., paintings, photographs, sculptures, artist books, multimedia installations, videos, soundworks and CD-Rom art) as well as related contextual documents (e.g., conference papers, interviews, documentations, reports and correspondence). Not only metadata and preview images but also direct links to qualitative reproductions of each item on the content partners' websites (or other portals), enhances the Internet user's search for digital reproductions of contemporary art and contextual information on them.

DCA endeavours to raise general awareness of contemporary art among European users and to broaden the understanding and significance of one of the most contemporary forms of cultural heritage in Europe. Contemporary art invites us to reflect upon what art is today and what it can be tomorrow. Furthermore, contemporary art also challenges us to reflect upon the society in which it is produced. DCA's digital corpus is therefore an invaluable complement to the other content in *Europeana*.

Contemporary art is a type of cultural heritage with high cultural relevance and an unrivaled potential of topicality and present-day relevance. While older types of art relate the material, emotional and intellectual world of our ancestors, contemporary art mirrors that of our own time and in the best cases also presents a critical view of it.

Contemporary art also mirrors the events and issues that have shaped the history of the European Union: the globalisation, the search for a European identity, the fall of the communist governments in Eastern Europe, the hegemony of cross-border capitalist trade, the struggle for equal social rights, ...

Contemporary art cannot be strictly limited to national or even European dimensions. The transnational character of our era shapes both the institutional collection policies and the way artists create, exhibit and sell their work. Contemporary art is a result of the interaction of the personal (often locally rooted) backgrounds of the artists with the global world in which they live.

Art has always had an international as well as a national importance and relevance; it feeds on the aspect of geographical border crossing as much as it is deeply rooted in national cultural and historical backgrounds. The globalisation of our time has entwined the different national histories more than ever and concerns the inside as well as the outside of Europe. This gives contemporary art and its artistic reflection a special, even critical, role within the context of a European Union in search of a cultural, social, economic and political identity.

Because contemporary art is to a large extent visual in nature, it transcends the limitations of language-based art forms such as literature, theatre, songs etc. This makes contemporary art perfect for a portal such as *Europeana* that aims to transcend linguistic, geographical and cultural barriers. It fosters European citizens' knowledge and awareness of each other's cultural expression.

Despite this high cultural relevance it is surprising to notice that contemporary art is today still heavily underrepresented in the *Europeana* portal, which aims to provide the general public with online access to high-quality European cultural heritage content. At the beginning of the project the DCA consortium estimated the total amount of contemporary art in *Europeana* to be less than 0.05% of the total available content. By adding its digitised content DCA has made a significant contribution to remedy this imbalance.

1.1.2. Targeting best practices along the digitisation trajectory

DCA has been a pioneering project in that it was the first and only collaborative European project focussing on the digitisation of contemporary art in general. With digitisation increasingly gaining importance in institutional policies, the project proved to be an excellent platform for knowledge-sharing and expert support. The content partners invested time in carefully following the whole trajectory of the digitisation lifecycle and setting up a digitisation plan with the help of the technical partners and the more experienced content providers.

The expertise and know-how regarding digitisation, metadata mapping and aggregation varied considerably within each single partner institution. Each collection often comprises different formats that require different solutions for their collection registration, digitisation, archiving, preservation and online access. To ensure interoperability between the individual collection management systems, the aggregators and *Europeana*, all phases in the process of digitising content, including delivering it to *Europeana*, were covered through the DCA project.

DCA provided the basis to yield the highest quality reproductions considering the content partner's technical environment and financial resources. Special attention was given to including the whole lifecycle of a digitisation project into the procedures planned. The lifecycle of a digitisation project basically includes the following phases and steps:

1. Content selection	2. Digitisation	3. Internal data management	4. Dissemination
Documentation	Logistics	Sustainable storage	Dissemination server
Physical preparation	Digitisation	Database creation and management	Presentation platform
Copyright status/clearing	Creation metadata	Data back up and transfer	Transaction system
Selection	Quality control	Transfer to dissemination formats	Feedback system

The best practices implemented were evaluated and adopted on the grounds of expert assessment of digitisation procedures, equipment and parameters (e.g., file formats, codecs and compression levels), metadata schemes, database systems, and of presentation/documentation issues. The goal was to ensure a successful yield in the user queries as much as serendipity to incite active re-use and interest in further use of the *Europeana* portal.

The main issues concerning the DCA project were the choice of specifications for digitisation and metadata, in order to make them interoperable and sustainable, and finding the appropriate aggregation solution for each content partner. The ingestion into *Europeana* was a major result of the project. The artworks and related contextual documents that were digitised in DCA mostly belonged to small or middle-sized collecting institutions (mainly museums and festivals). This type of institution often experiences difficulties to start up or to increase its digitisation process and contribution to *Europeana*. DCA, as a collaborative project, offered them the means, expertise and know-how required to make up their arrears. Some of the DCA partners have already played an important role in European and national/regional digitisation projects (for example ATHENA³, GAMA⁴, BOM-VI⁵, Archipel⁶, Play Out⁷, Inside Installations⁸, OASIS Archive⁹

³ ATHENA reinforces, supports and encourages the participation of museums in the Europeana project. The project developed a common harvesting format for digital museum content to be collected and delivered to Europeana, as well as finding solutions for enhancing multilinguality in Europeana. More information can be found on <http://www.athenaeurope.org/index.php?en/1/home>

and Linked Heritage¹⁰). They contributed their valuable expertise and know-how to the DCA project, shared it with the other partners and applied it to the specific but at the same time very diverse field of contemporary art.

To sum up, all objectives are related to the following three major areas:

1. Carrying out a quality-driven and sustainable digitisation of contemporary artworks and related contextual documents, establishing best practices and guidelines.
2. Promoting European cultural heritage manifest in contemporary art through the dissemination of the digital reproductions and metadata, by enhancing online access to these for an interested public through *Europeana* and the online presentation platforms of the content partners.
3. Making contemporary art institutions familiar with *Europeana*.

DCA aimed to deliver *Europeana* not only with text and image material, but also an important amount of video and audio material - two types of material that are currently still underrepresented in the cultural heritage portal. Because of this the project consortium gave special attention to the kind of art that incorporates technology, such as video art and more recent forms of media art. Due to the innovative character of these technology-based artworks, institutions other than traditional ones collect an important amount of these works and their

⁴ GAMA provides an enhanced online access to a variety of European media art archives. The objectives of GAMA were to significantly increase awareness and mediation of media art; be Europe's key online portal to its media art archives; facilitate the discovery, use and re-use of European digital cultural and artistic contents in Europe for users; and combine and adapt existing standard and state-of-the-art solutions to meet the needs for interoperability between the individual archives and their heterogeneity. More information can be found on <http://www.gama-gateway.eu/>

⁵ The BOM-VI project was about preserving and accessing multimedia content in Flanders. It contained six work packages: on user needs; archiving and selection; metadata standards and exchange formats; rights management on digital objects; infrastructure for digital preservation and accessing; development of a common platform for innovation. More information on <https://projects.ibbt.be/bom-vi/>

⁶ Archipel is the follow-up project to BOM-VI. Within the project, research is carried out on digitising and archiving, sustainable online disclosure, legal challenges surrounding the re-use of digital archives, and a common demonstrator platform. More information can be found on <http://www.archipel-project.be/>

⁷ Within the framework of the 'Play Out' project, the NIMK disclosed parts of its video- and documentation collection in a digital way. The actual digitisation of the collection was performed in synergy with research on conditions for uncompressed storage on hard disks. More information can be found on <http://nimk.nl/nl/play-out>

⁸ Inside Installations: Preservation and Presentation of Installation Art was a research project on the care and administration of an art form that is challenging prevailing views of conservation. Over thirty complex installation case studies had been re-installed, investigated and documented. The project website offers a digital repository of the project's results and is continuously increased by project partners as their research unfolds. More information can be found on <http://www.inside-installations.org/home/index.php>

⁹ OASIS Archive has established a distributed Internet platform for research, preservation and documentation of electronic arts. The goal was to provide a complex system in order to ensure the sustainable availability of European cultural heritage in the field of electronic arts. More information can be found on <http://www.oasis-archive.eu/>

¹⁰ Linked Heritage's main goals are to contribute large quantities of new content to Europeana (from both the public and private sectors), to demonstrate enhancement of content quality (in terms of metadata richness, re-use potential and uniqueness) and to enable improved search, retrieval and use of Europeana content. More information can be found on <http://www.linkedheritage.eu/>

contextual information. This is the reason why organisations like AE, EMAF and WRO who were originally known for their media art festivals, have been included in the DCA consortium.

1.2. The consortium

The DCA consortium comprised four technical partners and twenty-one content providing partners from twelve European countries and Iceland. The collecting institutions mostly stem from countries that are lagging behind in terms of making their cultural heritage accessible through *Europeana*, the so-called Tier 1 and Tier 2 countries.

The group of participating collecting institutions was comparatively large. The participating content partners not only showed a variety of cultural backgrounds and national languages, but also represented a wide range of practices and types of institutions. National and regional museums, art institutions and art festivals each follow different missions and policies, target a different user group behaviour and cater for different expectations, focussing on different priorities and objectives. In fact, the content partners covered the whole spectrum of operational structures (from state museums to festival organisations), funding settings (from state-run organisation to non-profit cultural institution), mission focus (from museum activities to festival activities), collections (from heterogeneous to single content types, from media artworks to photography and book art). This diversity translates into different collection management practices, long-term preservation policies and technical requirements for the digital reproductions.

The works that were digitised within the framework of the DCA project mostly belong to small or medium-sized collecting institutions (mostly museums). This is a type of institution that often experiences difficulties to start up or to increase its digitisation process and contribution to *Europeana*. The reason for this is a lack of dedicated means and an exchange of expertise and know-how. Although the size of the participating museums (and other collecting institutions) is often small or medium, their cultural relevance is high:

- some are national museums for contemporary art (LCCA, SERRALVES and MODERNA GALERIJA);
- some are national museums for fine arts with a collection of contemporary art (LISTASAFN, EPMAS and MRBAB-KMSKB);
- some are museums with a close link to the city or region in which they are based, but with strong or growing international reputations (MBVB, MAC, RAM, MMSU and MuZEE);

- some are small collecting institutions dedicated to the most contemporary form of contemporary art, media art, and boast the most important collection of this type in their country (ARGOS and NIMk/LIMA¹¹);
- some are festivals that are pioneers in the presentation of media art, and have a collection of a type of art that is still largely lacking in art museums (EMAF, TM, AE and WRO).

The collections contain a considerable amount of masterpieces from well-known artists such as Marina Abramovic, Orla Barry, Carsten Nicolai, Blast Theory, Christian Boltanski, Marie José Burki, Luc Tuymans, Fiona Tan, Gusztáv Hámos, Sanja Iveković, Bjorn Melhus, Dan Perjovschi, Steina Vasulka, Franz West and IRWIN.

To assist the content partners in their efforts, four other partners have joined the project to help with coordination and technical support:

- PACKED, the Flemish centre of expertise in digital heritage (coordinator of DCA);
- IMINDS¹²- Department of Electronics and Multimedia Lab (Faculty of Engineering and Architecture, Department of Electronics and Information Systems);
- the Image, Video and Intelligent Multimedia Systems Lab (IVML) of the School of Computer and Electrical Engineering and the Institute of Computer and Communication Systems (ICCS) at NTUA;
- UBITECH, a Greece-based SME providing technical solutions and consulting services.
- The consortium allocated them an important role in terms of sharing their expertise and know-how with the content partners, especially regarding the online access and exchange of cultural heritage collections.

1.3. The targeted objectives

These were the objectives that DCA aimed to achieve and that were described as follows in the work plan at the onset of the project:

- To strengthen the support for digitisation within the field of contemporary art by receiving funds from the European Commission. The financial support for digitisation is the first step needed to make the content accessible and retrievable in an online environment.
- To raise the awareness of *Europeana* within the field of contemporary art. The small amount of contemporary art present in *Europeana* is certainly partly due to the fact that the contemporary art field is not very familiar with the *Europeana* initiative.

¹¹ Due to a total discontinuation of financial support from the Dutch government, many Dutch contemporary art institutions had to close down at the end of 2012. Amongst them the internationally renowned Netherlands Institute for Media Art (NIMK). Part of their staff reconfigured as the new organisation LIMA (living media art), thus ensuring the continuation of NIMK's work and collection. From 1 January 2013 LIMA also took over NIMK's role in DCA.

¹² Formerly named IBBT (Internet BroadBand Technology)

- To increase the presence of contemporary art in *Europeana*, the single access point to European cultural heritage. Contemporary art is a part of the European cultural heritage that until now has been heavily underrepresented in *Europeana*.
- To broaden the presence of cultural heritage content in *Europeana* from the so-called Tier 1 and Tier 2 countries that are behind in their effort to make their cultural heritage accessible through *Europeana*. DCA aims to deliver content to *Europeana* from six Tier 1 countries and from four Tier 2 countries.
- To improve the preservation of the selected contemporary artworks. Documentation is an important process in the preservation of art; especially in that of forms of contemporary art that have a complex or ephemeral nature. Digital reproduction is an essential part of this documentation process. High-quality digital reproduction can also enrich the scientific research of material aspects of artworks in order to improve their preservation. The availability of high-quality digital reproductions will also help to avoid possible wear and tear, damage and loss every time the artwork itself needs to be consulted; and as such prolong the longevity of the artwork.
- To increase the accessibility of contemporary artworks. Offering online access to digital reproductions is less labour-intensive, costly and risky for collecting institutions than offering a broad audience access to the artworks themselves.
- To enhance the accessibility and retrievability in an enriched and user-friendly way outside the usual museum or gallery setting for different target groups (from general audience to specialists) by delivering the digitised content to *Europeana*. The aim is to ensure that the metadata and contextualisation of the newly digitised content can easily be found - not only in a directed search for them, but also so that, for example, in thematic searches the content appears on an equal footing alongside other culture heritage forms that had until today a stronger online presence (e.g., medieval manuscripts, 17th century books, and early photographs).
- To enrich the *Europeana* portal with information that will create emergent contexts and allow for more serendipity in search results. An inherent characteristic of contemporary artworks is that they cover a broad range of topics and meanings. Their inclusion in *Europeana* will lead to new perspectives by juxtaposing artistic takes on reality with political or scientific approaches on the same issues or with the same annotated keywords.
- To monitor the digitisation of the content items (artworks and related contextual documents) and the delivery of this new digital content to *Europeana*. Compared to the huge numbers of items that are already available in *Europeana*, DCA's number of content items might look like a small amount, but one has to take into account that the digitisation of artworks (especially contemporary artworks) is a very labour-intensive and therefore costly process. The amount of digitised material at the end of a digitisation project for contemporary art cannot be compared to the amount of digitised material at the end of a digitisation project of solely texts/books, photographs or even videos. A large part of the content items provided in *Europeana* at present only contain metadata, while

DCA aims not only to provide access to the metadata but also to high-quality digital reproductions of the artworks and related contextual documents.

- To add to the diversity of content types in *Europeana*. DCA will not only deliver access to texts and images, but also to other content types such as video and audio recordings. This diversity adds to the relevance of DCA for *Europeana*. DCA will deliver a considerable amount of contemporary art to *Europeana* in the form of video and audio – two types of content that *Europeana* itself would like to present more.
- To encourage and facilitate the participating content partners to continue their efforts after the end of the project, and other collecting institutions to follow their example. The lack of high-quality digital contemporary art content is in many cases largely due to the absence of shared know-how and expertise. A platform for contemporary art museums and other collecting institutions is lacking in order to share such knowledge regarding the issues related to the digitisation of contemporary art and the contribution of content to *Europeana*. The best practices developed and disseminated by DCA will change this situation for the better.

Chapters 2 and following describe the way the DCA project achieved these objectives, the tools it applied to do so, the means it used to remedy unforeseen situations and encountered difficulties, and also the lessons it learned.

1.4. Expected impact

The digitisation of 27,671 items from contemporary art collections and the ingestion of their metadata and thumbnails into *Europeana* constitute the immediately tangible final results. The short and medium term impact expected is manifold.

The inclusion of contemporary art into the content offered by *Europeana* will undoubtedly help to draw new and probably also younger users to the portal. This new content will enrich the *Europeana* portal with information. Contemporary artworks cover a broad range of topics and meanings. Their inclusion in *Europeana* will open new perspectives.

DCA increased the access to contemporary art in other environments than its original museum or gallery settings and provided access to it, for example, for less mobile people, who will be able to enjoy the artworks without physically having to go to a museum.

For the users who are part of the general audience, the online accessibility and retrievability (through *Europeana* and other platforms) of the artworks and the related contextual documents will help them to expand their horizon and knowledge. The resulting broad cultural horizon and knowledge will help them to become or remain part of social networks and to improve their possibilities and opportunities in society. Within the general audience exists a broad 'basic' knowledge of art that shows a great potential for further (self)education, as can be seen, for example, with the increasing interest of third age groups in art history.

The added value for the specialised user lies in the fact that the online accessibility and retrievability (through *Europeana* and other platforms) will make it possible to perform their tasks (e.g., research, education and criticism) in an easier and improved way. Especially since art and cultural heritage education all over Europe is part of a very broad range of education forms (thus not only specialised education), a project like DCA is of particular relevance as it contributes by making high-quality content available.

For the participating contemporary art museums and collecting institutions DCA had an added value in different ways. The effect of the project on the digitisation policies of the participating institutions and in the medium term also of other collecting institutions is invaluable. It has also helped create a more substantial interest within institutions in the online presentation of their collections. Some of the content partners have even built a new online collection presentation platform or renewed their existing one.

DCA provided:

- the much needed financial support (through the EC grant) to start or speed up their digitisation activities;
- a platform to share expertise and know-how with other institutions that is required to start, speed up or improve their digitisation activities;
- an opportunity to familiarise with *Europeana*, and to deliver content to it.

Another impact will be the improvement of the preservation policies of the content partners. The availability of high-quality digital reproductions will help to avoid the possible wear and tear, damage and loss every time artworks need to be consulted, and will thus prolong their longevity. Documentation is an important requirement for the preservation of artworks, especially for forms of contemporary art that have a complex or ephemeral nature. Documentation is often the only way to preserve the artworks. During DCA this digital documentation was established, through the creation of digital reproductions of both artworks and contextual documents.

For the users from the broader field of tourism, IT technology, creative industrial or communication design and marketing, cultural heritage (and therefore also contemporary art) has an important value. In a European society that becomes more and more service and innovation driven these users are important. For them, having direct access to this kind of content is often a requirement in order to execute their actions in a successful way. Through its digitisation, DCA also helped to create, enhance and facilitate the access of this user group.

2. Implementation process

The 'Description of Work' (DoW) that is part of the Grant Agreement with the European Commission delineates all tasks, grouped in six work packages, that the consortium deemed necessary to achieve the proposed results and the defined outcome.

One work package (WP1) was dedicated to overall project management by the coordinator, supported by the Technical Management Group, consisting of PACKED, IMINDS, NTUA, UBITECH, MRBAB-KMSKB and NIMK/LIMA, and the Project Management Board, consisting of all WP leaders. Another work package was devoted to dissemination (WP7). LCCA took over leadership for this work package. The remaining work packages were dedicated to the implementation of all tasks along the digitisation trajectory:

- WP2: Partner coordination and technical specification of collections – leader: PACKED;
- WP3: Metadata requirements for digitising and archiving contemporary art – leader: IMINDS;
- WP4: Digitisation (supervision) – leader: MRBAB-KMSKB;
- WP5: Preparation, aggregation and ingestion of content – leader: NTUA;
- WP6: Long-term sustainability (guidelines for long-term preservation of digital files) – leader: NIMK/LIMA.

Although described as single entities, i.e., work packages, the work itself was highly interrelated and depended on good and important collaboration, frequent cross-checking and revision, an effective communication flow as well as a high level of transparency and recording of progress and results.

More than 739 PM¹³ were invested during the 30 months' project in order to achieve all the results described. The following paragraphs trace the trajectory of the work carried out, from the planned version as expressed in the Description of Work to the actual implementation and achieved results.

2.1. Assessing the status quo

In order to fulfil the objectives outlined in the Description of Work in a standardised, coordinated way it was important to get a clear view of all expertise that was present in the DCA consortium. The level of experience of the majority of the content partners in the area of digitising contemporary art was not known at the onset of the project. It was necessary to understand all

¹³ This is the number that was included in the amended Description of Work that is part of the Grant Agreement. The exact number will be only be known when all project partners provide their exact figures in July-August 2013.

levels of expertise and all facets of the content partners' work methods in order to establish an appropriately high-level of quality based on adopted standards in the field of art digitisation.

In a concerted effort, the Technical Management Group produced a questionnaire in order to create an 'experience profile' for each content partner based on the survey results as part of WP2. The results provided basic input for the activities of all technical work packages. The survey collected information from all content partners on:

- their metadata practices (e.g., type of metadata scheme, used fields, use of thesauri, interoperability of export);
- their IPR expertise (e.g., network of experts to rely on and solutions used in the past);
- their long-term preservation policy (e.g., presence of a preservation strategy, knowledge about hardware and infrastructure, safety of the digital files in terms of access and storage);
- their digitisation practices (e.g., workflows and equipment that were used in the past, desired outcomes, known target formats, available digitisation infrastructure);
- their aggregation options (including awareness about existing aggregator(s), current relations with an aggregator, available aggregation schemes).

The results of the survey were communicated back to the Technical Management Group to help them identify support requirements, and detect possible concerns, obstacles or issues that might occur during the digitisation implementation phase. It also enabled them to communicate at an early stage on recommendations and solutions for improvement or remedial actions. On the basis of the questionnaire's final assessment, deliverable *D2.1 Assessment of the individual partners and their expertise* was also created. The deliverable included the individual content provider profiles obtained from the assessment of the survey results. This deliverable helped to measure the progress made by all content partners during the lifetime of the DCA project.

This kind of status quo assessment provided the basis for refining the work plan and identifying the best route to be taken. It greatly helped to reconsider the approach to be taken within certain tasks fixed in the Description of Work. For example, it became clear that some partners would need support in having an online platform to host their digitised reproductions. UBITECH therefore provided the LIDO Viewer. Suggestions about collection registration were also made in order to assure at least a minimal collection registration. Most of all it became obvious that the need for support in digitising and defining standards for digital video reproductions was ubiquitous. The DCA consortium greatly benefited from the expertise provided by PACKED and NIMK/LIMA in this area.

The individual content partner profiles gave rise to the idea of creating 'partner dossiers' which collocated pertaining information of each partner and allowed for quick access to basic

parameters (from the Description of Work and various progress reports) to all, the partners themselves, the coordinator and the WP leaders.

What was surprising was the differing status quo of the content partners involved which not only explained the divergence of PM and budget needs between them, but also some necessary deviations from and amendments to the Description of Work during the implementation of the project itself. The survey showed how different the starting point for digitisation was amongst the content partners. Some had no proper collection registration or management system to inform them what they store away in their depots, and they therefore could only vaguely describe what they had in store for digitisation. For the participating media art festivals for example, their database was oriented towards submission by artist and year, but contained clustered information that did not distinguish between individual items. In other cases it was not always clear if the artist submissions were archived or had been returned without retaining a copy. Some content partners actually had to physically go through their archive rooms and depots to verify their assumption about what items they had in store for digitisation. Others had documented their archives and collections (in terms of metadata) well, and could exactly pinpoint how many and which artworks and/or contextual documents they were planning to digitise as part of the DCA project.

The benefit of such an assessment before starting to fine-tune the work cannot be stressed enough. The obvious differences in experience and approaches of the content partners led to awareness being created, and the development of a digitisation workflow as well as an individual digitisation plan.

2.2. Establishing the digitisation workflow

The first six months of the DCA project were dedicated to collecting all necessary information, finding common denominators and fixing respective quality parameters (e.g., file formats, resolution, bit depths, codecs and compression levels). A common ground to get the digitisation properly started was ensured by establishing the digitisation workflow and a digitisation plan template to be used by each partner.

In theory, every content partner was well aware of the digitisation trajectory. However, the reality was different, due to time pressure and lack of resources. Some of these neglected aspects of the workflow are the definition of underlying policy, the selection criteria and the long-term goals, the creation of a solid digitisation plan, the identification of the scope of work to be subcontracted, the investigation of optimal technical requirements and the evaluation of the best ratio of quality parameters and costs.

To tackle such aspects, PACKED as WP2 leader organised a workshop in Brussels on 22 and 23 March 2011 thematically dealing with the complexity of the digitisation process. The

workshop focussed on aspects such as the life-cycle of a digitisation project, the planning, the preparation of the material, the technical parameters, the subcontracting and the actual digitisation.

Those partners digitising media art were invited by NIMK on 24 March 2011 to visit their media lab in Amsterdam. There they received a professional introduction in situ on how to deal with media art. Due to its specific nature, media artworks require specific attention and expertise to be properly digitised.

Based on the workflow presented in the workshops and that described in the internal deliverable *D4.1 Digitisation workflow description for digitising the selected artworks* (a kind of prequel to the public *D4.2 Guidelines for an A-Z digitisation workflow for contemporary art works*), a template to establish individual digitisation plans was developed (see paragraphs *2.3 Sharing knowledge and best practices* and *4.1 Digitisation plan*).

2.3. Sharing knowledge and best practices

2.3.1. Getting started on the digitisation

For a successful outcome of the project, the preliminary task was to define digitisation plans accommodating the diversity amongst content partners in terms of:

- digitisation objectives;
- availability of resources and technical material;
- nature and location of collections and archives;
- the individual level of expertise.

Moreover, there was also great diversity amongst the items to be digitised (e.g., paintings, sculptures, photographs, books, texts, installations, video and sound material) and the broad range of topics and meanings to be taken into consideration. This diversity entails specific approaches and different technical requirements and specifications.

Equipped with the background information, the various aspects of the digitisation workflow and best practices, the content partners had designed their respective digitisation plans. To this end they checked their content lists to see which objects could be digitised when and according to which procedures. The resulting draft versions of the plans explained how the individual partners intended to adapt the standard workflow to their own given situation.

The Technical Management Group assessed these draft versions in terms of:

- technical specifications such as the digital file formats, codecs, compression, bit depth, colour space and resolution;
- the feasibility of the schedule and the breakdown of tasks;

- the approach taken (e.g., digitisation method, equipment and targeted quality level).

The results of the assessments were discussed with each content provider individually in order to tackle possible risks in terms of time schedule and technical parameters. Technical questions from content partners revealed common problems and often brought partners together to share their knowledge (for example on how best to digitise installations and sculptures). These discussions and exchanges also determined the topics of workshops that aimed to provide the consortium with useful complementary information and advice.

At this stage of the preparation phase the content partners were already confronted with very specific and practical questions such as:

- What kind of camera should be used if the budget available doesn't permit one to follow the highest proposed standards?
- If two different types of scanners were available, which one would be recommended for a specific collection?
- The quality of the source material is quite low (e.g., old VHS videos), is it worth spending money to meet the highest standards?
- Which file formats are needed for online access and which for conservation? What are the preview requirements of *Europeana*? ...

The result of the communication between the content partners and the Technical Management Group, and in particular with NIMK and the WP4 leader MRBAB-KMSKB, was a 'final' version of the digitisation plan per partner. The revised and approved digitisation plans were to provide a solid basis for an optimal digitisation performance from M06 onwards. They also became the framework for a progress-monitoring tool released by WP4 (see paragraph 4.2 *Progress monitoring tools and quality specification control*).

After six months, with the status quo assessed, the digitisation plans drafted, improved and finally approved by the Technical Management Group, the green light was given to start the actual digitisation of the artworks and contextual documents within each partner institution.

One mistake that can often be made is not to invest enough time and effort in preparing and analysing the digitisation project itself. It became clear that the Description of Work was built on a lack of expertise and/or experience which led to misconceptions in the initial plans (including PM investment, tasks and budget allocations) and a lack of verified knowledge of the status quo of the items to be digitised. The digitisation as indicated in the Description of Work, in terms of amount per types of artworks or contextual documents, exact PM per task, in-house or outsourced tasks etc., were built of preconceptions that needed verification and often also adjustment.

At the end of the assessment cycle of the project in M06, it was already clear that the initial goal to produce same-quality digital content (with for example matching resolutions, bit depths, formats, codecs and device settings) needed to be reconsidered. The objective to attain the highest standards could not be realised by every institution due to financial considerations. Moreover, the digitisation goals (e.g., preservation, access, restoration, valorisation and promotion) determined by every content partner at the beginning of the project differed. For most of the content partners the principle 'digitise once for all purposes' is only too valid. However, for some content partners taking into account all future uses was not practical. Rather than maintaining the principle 'same high-quality digital content' for the whole consortium' it was more appropriate to go for the highest possible quality per individual content partner, taking into account its digitisation goals and resource limitations, and to opt for a sensible scope of use for different categories of objects.

For some content partners the verification of the feasibility of the first draft of their digitisation plan led to intensive discussion about the chosen strategies, the defined segments, the schedule and timing, and the improvements of quality of the supplied content. This caused their final version to be edited after the start of the actual digitisation. Certainly, this was not an ideal situation, but given the workload planned for the following twenty-four months, they had to go ahead with the digitisation. That is why in some cases the first monitoring report in M10 announced the need to re-adjust the digitisation plan. This resulted in an improved strategy of implementation in terms of segment definition and timing, technical specifications, procedures, and content delivery.

Although the time invested into setting up solid digitisation plans aimed to avoid constant readjustments, it became necessary to adapt the plans to the reality due to a variety of unforeseeable circumstances. However, a solid digitisation plan definitely helped avoid wasting time and effort in case of foreseeable events and procedures. Where there was need for adjustments, deviating from an elaborately and carefully conceived plan ensured that the deviation was also well considered.

Four months after the first progress monitoring, a second round of monitoring was carried out, which made it apparent that the digitisation plans should be looked upon as a dynamic support tool, helping to find the best way to adapt to a new situation.

In general almost no changes needed to be made to the original digitisation plan by the majority of content partners. However, some other content partners faced external factors that necessitated changes in the proposed schedule or the targeted technical parameters. Together, the WP2 and WP4 leaders supported the content partners in finding tailor-made solutions through intensive communication. The aim was to help them find solutions that would keep them targeted towards their proposed schedule or re-adjust their track to an improved schedule, and to align the content provided with the Description of Work content lists.

2.3.2. Metadata implementation

The caretaking of a contemporary art collection or archive requires the use of a content management system. This in turns requires that the items are registered and described. The information thus collocated in relation to the items is entered as 'metadata' into a database according to a metadata scheme. The caretaking of a digital collection (even consisting of digital reproductions) requires a similar approach.

However, a sufficient description of the artwork or contextual document and its digital representation is often relayed to a later time due to the lack of staff resources. It is something that should be started in parallel to the actual digitisation.

One of the main objectives of the DCA project was for *Europeana* to harvest the metadata of the digitised contemporary artwork and contextual documents. However, getting good user results does not only depend upon the export of such metadata, it actually starts with selecting which metadata is entered in the collection registration or management system of the content partner, and how. Therefore, metadata handling was a special focus of the DCA project. WP3 was entirely devoted to metadata guidelines and best practices. This resulted in two deliverables:

- *D3.1 Metadata implementation guidelines for contemporary art;*
- *D3.2 Recommendations on contextualisation and enrichment of contemporary art.*

To produce metadata implementation guidelines for contemporary art, DCA focused on the following goals:

- introducing metadata and providing a broad overview of the main metadata standards;
- producing guidelines to describe contemporary artworks and contextual documents for cataloguing purposes;
- producing guidelines for metadata exchange in the field of contemporary art;
- introducing some widely used vocabularies;
- producing a concise contemporary art vocabulary.

It is important to notice that the guidelines produced already incorporated some general contextualisation guidelines, such as resource-based descriptions. This is because metadata implementation guidelines and contextualisation cannot be separated from each other. All such metadata implementation guidelines are produced technology-independent (XML vs. RDF).

We gave the content partners an overview of the different types of metadata, and explained how it can be serialised. We also focused on the different levels of a digital resource (artwork vs. digital representation of the artwork) and gave an overview of the main domain metadata standards for cultural heritage in general:

- CDWA and SPECTRUM for museum collections;
- MARC for library collections;
- ISAD(G) and EAD for archive collections;
- EN15907 for cinematographic collections.

Alongside these domain metadata standards for cataloguing purposes, some metadata standards were also discussed for metadata exchange purposes: LIDO, Mets and OAI-ORE.

We first introduced a general model for describing artworks in general. These typically need descriptions on the different levels of the digital resource. Descriptions of the artwork itself and the digital representation of that artwork were therefore required. Next, we applied this general model to contemporary art to obtain some basic guidelines for describing contemporary art for cataloguing purposes.

For the guidelines on metadata exchange in the field of contemporary art, we discussed a horizontal aggregator and a vertical aggregator for contemporary art. The horizontal aggregator is *Europeana* and the *Europeana* data models ESE and EDM were discussed. For the vertical aggregator, GAMA, a harvester targeted specifically towards media arts, was proposed together with the GAMA model. The requirements for both aggregators were applied to LIDO in order to obtain an application profile of LIDO suitable for the metadata exchange of contemporary art.

For controlled vocabularies, we introduced

- AAT (a thesaurus for describing art and architecture);
- TGN (a vocabulary for place names);
- ULAN and RKDArtists (vocabularies for artist names).

To generate a concise DCA contemporary art vocabulary, the vocabularies of the content partners were analysed in order to acquire a common subset of terms that are used by several institutions. This basic list of terms was extended with some terms of the GAMA vocabulary. This formed the basis for the DCA vocabulary which was also mapped to AAT terms for interoperability as well as to anticipate its future use in some aggregators.

To produce the recommendations on contextualisation and enrichment of contemporary art, we approached contextualisation from a linked data perspective, i.e., technology-dependent in contrast to *D3.1 Metadata implementation guidelines for contemporary art*. For this we focused on the following goals:

- introducing the Semantic Web;
- generating best practices for describing and contextualising data;
- introducing SKOS;
- formalising the contemporary art vocabulary in SKOS.

To introduce the Semantic Web, we explained a bit of the history of the Web and what the Semantic Web was invented for. It also provided an introduction to the basic building blocks of the Semantic Web, which are data descriptions using RDF and URIs, adding semantics via RDFS or OWL, querying through SPARQL, and publishing as Linked Open Data (LOD). To summarise, we also listed some benefits of using these semantic web technologies in order to maximise the contextualisation of data.

Contextualisation in the Semantic Web basically occurs in three steps. It starts already with the data model / ontology, because this already adds semantics to the descriptions. We started from the data model for contemporary art designed in *D3.1 Metadata implementation guidelines for contemporary art*. For each of the identified resources of that data model, we discussed some well-known ontologies. A second contextualisation step is to describe the resources so they can be unambiguously identified. For this, the start was the field list described in *D3.1 Metadata implementation guidelines for contemporary art*. If this field list is followed precisely, each resource is described in an unambiguous way. Then, one will be able to enrich each resource during the third step of contextualisation, i.e., one can link it to resources on the Web describing the same thing. When following this contextualisation method, one is able to publish five-star ranked LOD. For this step, we provided a list of data sources that can be used for enriching each type of resource. At the same time, it also provided examples of SPARQL queries that can be used for enriching data.

The use of controlled vocabularies can support the contextualisation of one's contemporary artwork descriptions. SKOS was introduced for this type of work. SKOS is actually an OWL ontology for describing controlled vocabularies. It allows for one to formally describe the content and structure of structured vocabularies, such as thesauri, taxonomies, classification schemes, etc. Because SKOS is based on the Resource Description Framework (RDF),¹⁴ a Knowledge Organisation System (KOS) that is defined using SKOS is machine-readable and publishable on the World Wide Web. This subsequently allows for concepts to be linked with other concepts defined in the Web of Data and is important for the creation of a contextualised description. At the same time, SKOS is also a means to support multilingualism. The terms of a SKOS are identified using URIs, but each term can have multiple labels in different languages to support multilingual search and classification. Finally, we presented the contemporary art vocabulary formalised in SKOS. This vocabulary was initiated in the *D3.1 Metadata implementation guidelines for contemporary art* and the concept list presented there forms the basis for this SKOS DCA vocabulary. The concise vocabulary consists of nineteen terms, each with several labels in different languages to support the multilingual search in *Europeana*.

As preparation to both *D3.1 Metadata implementation guidelines for contemporary art* and *D3.2 Recommendations on contextualisation and enrichment of contemporary art*, we used a questionnaire, which was filled out by the content partners. This gave a good overview of the metadata implementation skills of the content partners. It revealed that some content partners were still having trouble in registering their artworks and contextual documents, while others were already employing semantic web technology (LOD) to describe their artworks. For this reason, we chose to focus in *D3.1 Metadata implementation guidelines for contemporary art*, on general metadata implementation guidelines in a technology independent way. *D3.1 Metadata implementation guidelines for contemporary art* already focused on the contextualisation of

¹⁴ RDF is used as a general method for conceptual description or modelling of information that is implemented in web resources, using a variety of syntax notations and data serialisation formats.

artwork descriptions. *D3.2 Recommendations on contextualisation and enrichment of contemporary art* went one step further in terms of contextualisation by introducing the Semantic Web and semantic web technologies as a way of contextualising the artwork descriptions.

Both *D3.1 Metadata implementation guidelines for contemporary art* and *D3.2 Recommendations on contextualisation and enrichment of contemporary art* were presented to the content partners in the form of workshops. During the consortium meeting in Porto (21-22 September, 2011), two workshops were proposed: one on metadata implementation guidelines and one on initiating the vocabulary design. During the subsequent consortium meeting in Berlin (6-7 February, 2012), a workshop on LIDO was given by Regine Stein (Philipps-Universität Marburg - Bildarchiv Foto Marburg). She presented the contemporary art application profile of LIDO, based on the field list generated in *D3.1 Metadata implementation guidelines for contemporary art*. Another workshop on the contemporary art vocabulary was organised to continue the design of the contemporary art vocabulary. During the consortium meeting in Ljubljana (3-4 October, 2012), *D3.2 Recommendations on contextualisation and enrichment of contemporary art* was presented in one workshop and another was devoted to presenting the formalised SKOS vocabulary for contemporary art.

2.3.3. Long-term preservation

Digital preservation is another essential element of the digitisation process. However, the assessment showed that the policies and strategies implemented with regard to long-term preservation vary considerably amongst content partners.

Digital preservation can be understood as the series of managed activities necessary to ensure continued access to digital materials for as long as necessary, involving the planning, resource allocation, and application of preservation methods and technologies to ensure that digital information of continuing value remains accessible and usable. It combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change and innovation. The goal of digital preservation is the accurate rendering of authenticated content over time. In order to safeguard the digital materials that are accessible today, it is important for an institution with any kind of digital repository to have a policy and plan on how to preserve and access the content for future use. Otherwise there is a risk that information will be lost. This applies to born digital materials as well as to digitised analogue material.

Originally WP6 had a different orientation from other work packages. It started out as a purely theoretical research task. The main aim was to provide the content partners with

- guidelines for the implementation of a long-term preservation strategy for their digitised material;
- state-of-the-art instruction on the use of persistent identifiers;

- best practices for a digital storage infrastructure for the long-term preservation of digital files.

At every consortium meeting during the DCA project, we shared the knowledge gained through workshops and surveys of standards and best practices. In this way, it provided comprehensive information to ensure the best-quality outcome, raise awareness and increase the knowledge level of all content partners. At the beginning and again three quarters into the project we surveyed the state of awareness and current practice in the digital preservation of the content partners. We had a full assessment of content partners' long-term digital sustainability profile and continued to fine-tune workshops accordingly.

Early in the DCA project we used the Digital Preservation Capability Performance Metrics to Monitoring tool. The results were used as input for the questionnaire described in paragraph 2.1 *Assessing the status quo*. Digital sustainability is an issue that concerns every organisation investing staff and financial resources in preserving digital files. Towards the completion of the digital reproduction phase, we applied the score model tool (see paragraph 4.4 *The score model for digital sustainability*) which helps detect the stronger and weaker points of the participants' digital household. On the basis of the 'scores', we communicated recommendations for improving the digital preservation awareness and status and minimising the risks where possible.

2.4. From digitisation to aggregation

2.4.1. *Europeana* and aggregators

With the digital reproductions ready and the appropriate metadata in place, the next step was to start bringing the content online – on the content partners' websites first, and then during a second phase by linking them to those institutional pages through the *Europeana* portal. For this, the digital content needed to be aggregated, i.e., collocated and prepared for harvesting by *Europeana* through an aggregator (see also paragraph 2.3.2 *Metadata implementation*).

The role of an aggregator, in the context of *Europeana*, is the collection of the content partners' metadata and the transportation to the *Europeana*. An aggregator is responsible for gathering material from individual organisations in any format, standardising the file formats and metadata, and channeling the latter into *Europeana* according to the *Europeana* guidelines and procedures. In addition, aggregators support the content providers with administration, operations and training. According to *Europeana's* Aggregators Handbook an aggregator is responsible for making the following data available:

- highest possible quality metadata describing a digital object. Metadata must be mapped to the latest *Europeana* Semantic Elements (ESE) version available;
- a link to the object for *Europeana* to generate images for use in the portal;

- persistent identifiers (URLs) – active and stable links to the described digital object on the provider’s site or the portal’s site;
- one persistent, unique identifier per record within the metadata, such as catalogue number as dc:identifier, or the URL of the object if the relationship is one-to-one.¹⁵

(See paragraph 2.4.2 *Creating an export for Europeana* for details on creating an export to *Europeana*)

Aggregators often constitute national or thematic portals. The DCA project never proposed to create its own dedicated portal and act through it as aggregator, since the core focus of the project was digitisation. However, DCA made use of an existing aggregator solution with NTUA’s MINT tool, should a content provider fail to find an available aggregator platform that would suit its needs and policies.

We brought DCA content partners in contact with aggregators with whom they were not familiar in the past, was done because we felt it might lead to another exchange of expertise. Aggregators often represent a certain network (e.g., national, thematic, content type specific) with which DCA partners might then have the opportunity to affiliate.

Research was carried out to identify existing and available aggregating bodies that would be suitable to cater for individual content providers. The selected aggregators were contacted with the aim to inform them about the DCA project, check their aggregation path to *Europeana* and inquire whether DCA partners could join their aggregation platform. During this research, DCA also investigated the sustainability of the supporting body/organisation behind the aggregator, and the costs for aggregation or possible membership fees. In WP2, we assessed the selected aggregators in terms of non-technical aspects, while in WP5 we did research on their technical requirements for aggregation. The description of the different types of aggregators and their implications were in the deliverable *D5.1 Assessment of the different aggregating platforms and their aggregation requirements*.

For *Europeana* it is important to estimate the amount of items and the kind of content offered for ingestion to their portal. In the deliverable *D2.2 Specification of proposed solutions for ingestion into Europeana* we informed the content partners on several important aspects and procedures, for example on the intent and impact of the Data Exchange Agreement (DEA) which had to be signed by the content provider as a pre-condition for being ingested into *Europeana*, as well as the rights statement provisions. An interview with *Europeana*¹⁶ provided the necessary

¹⁵ Europeana Aggregators’ Handbook, version October 2011, p.13. Available online <http://Europeana.acc.componence.com/documents/694736/720608/Aggregators+Handbook>

¹⁶ On 17 July 2012, the WP2 leader conducted an interview with Annette Friberg (Business Development Manager) and Annelies van Nispen (Operations Manager) of the Europeana Office at the Koninklijke Bibliotheek in The Hague (the Netherlands). Apart from collecting information as a basis for D2.2 Specification of proposed solutions for ingestion into Europeana, the discussion provided an opportunity to update Europeana about the project’s progress. As a result, some DCA partners were contacted again in order to see whether their choice of

information about their current strategies and methods for content ingestion. For further details on legal issues related to aggregation, see paragraph 2.4.4 *Legal issues*.

In addition to the DEA, there is an aggregator agreement between *Europeana* and the aggregator for ingesting content and mapping metadata schemes to the ESE/EDM. Finally, it is recommended to conclude an agreement between the aggregator and the content provider. In *D2.2 Specification of proposed solutions for ingestion into Europeana* we listed several issues that might be ruled in such an agreement:

- Safety of one's data: where is the submitted data stored? What kind of security management is in place?
- Terms of aggregation: depending on the aggregator's system, the content provider might have to prepare data in a certain way. The aggregator should explain in detail the (technical) procedure to be followed encompassing the whole trajectory from data preparation for mapping/submission to the aggregator, and ingestion to their platform and *Europeana*. Especially with visible aggregators other tasks may come into play such as providing a description of the institution, a logo, contact details etc.
- Schedule for and monitoring of the aggregation and harvesting process: a schedule for data submission to the aggregator and to *Europeana* should be fixed. The aggregator should agree to report the progress made and send proof of having the data in place to be harvested by *Europeana* in due time, so that only the obligation to perform remains *Europeana*'s responsibility and the partner/content provider has fulfilled its part of the DCA Grant Agreement.
- Sustainability: provisions should be made for updating the content submitted through data being provided at regular intervals to avoid obsolete information or data remaining present on *Europeana* (and on the aggregator platform). With a CC0 license, of course, this cannot be done for data that is already being re-used by third parties under this license. With the update, which usually means deleting the former set of data and replacing it with a new set, one could also add new data and replace broken links. The aggregator should be able to explain in detail what needs to be done on the provider's side to carry out an update.
- Cancellation: the aggregator should be able to guarantee full deletion of the provided data in the event of a cancellation of the relation between aggregator and content provider. This also relates to the question of data protection. Of course the case of third-party re-use under CC0 also applies here.
- Costs: if costs are implied for the technical services of aggregating to *Europeana*. There might also be costs arising from updating the data at regular intervals.

aggregator could not become more aligned with *Europeana*'s preferred aggregation routes (e.g., opting for the national aggregation initiative instead of the MINT tool).

Finally *D2.2 Specification of proposed solutions for ingestion into Europeana* also collocated information on the planned aggregation for *Europeana*'s harvesting procedure. This was necessary for *Europeana*'s ingestion team to avoid massive streams of data coming in all at once, and to be able to perform a quality control before display on the portal website. During the last months of the DCA project, *Europeana* made severe changes to its portal website and its back-end infrastructure. This caused significant delays in its content contribution workflow. To re-assure that *Europeana* would process the DCA content in time for appearance on the portal by the end of the project, a complete DCA ingestion plan was sent to *Europeana*. By informing them about the different aggregators in play (i.e., those chosen by the content partners) and the project deadlines, all possible efforts were made to ensure timely content provision and processing.

2.4.2. Creating an export for *Europeana*

One of the key objectives of the DCA project is to deliver *Europeana* with links to newly created digital reproductions of contemporary artworks and contextual documents from the content partners' repositories, together with related metadata and a preview version of the visual representation.

The preferred metadata format adopted was until recently the ESE schema, developed for the prototype version of *Europeana*, November 2008. It is an application profile based on Dublin Core (DC) providing a generic set of DC elements and some locally coined terms. Aggregators are advised to map their metadata to ESE according to the 'Metadata Mapping and Normalisation Guidelines'¹⁷. Within the mapping framework, requirements are set either regarding the metadata structure (e.g., mandatory metadata elements) or respective information to be recorded in the metadata elements (response to "who, what, where and when" queries). Before the end of the DCA project, *Europeana* replaced ESE with the *Europeana* Data Model (EDM) which is a major improvement on ESE. EDM transcends domain-specific metadata standards, yet accommodates the range and richness of community standards such as LIDO for museums, EAD for archives or METS for digital libraries. It facilitates *Europeana*'s participation in the Semantic Web, basing itself on an open, cross-domain, semantic web-based framework¹⁸. EDM is a more developed data model that brings meaningful links to Europe's cultural heritage data. Data from partners or external information resources with references to persons, places, subjects, etc., will connect to other initiatives and institutions. This will result in enriched content being shared and expanded, as more content is generated in a way that no single provider could

¹⁷ Europeana Metadata Mapping and Normalisation Guidelines, version March 2011. Available online, http://www.version1.Europeana.eu/c/document_library/get_file?uuid=b3cfcf47-da0a-4c6b-b1d7-9b08e162643e&groupId=10128

¹⁸ EDM factsheet. Available online, <http://pro.Europeana.eu/edm-documentation>

achieve alone. The EDM semantic approach will translate into the richer resource discovery and improved display of more complex data.

DCA had not intended to build an online contemporary art portal or to offer the services of a dedicated long-term aggregator for ingestion of new content to *Europeana* beyond the project lifetime. Within the project, the mapping tool for harvesting and ingesting content into *Europeana* developed by the DCA partner NTUA was available to all content partners. The platform has been deployed for a variety of aggregation workflows corresponding to the whole or parts of the backend service. This tool (the MINT ingestion tool) has already proved to be very successful in other European cultural heritage projects and acts within the DCA project as a dark aggregation platform for those partners for whom a suitable aggregator cannot be identified (nine out of twenty-one of the content partners opted for the MINT tool).

The MINT ingestion tool is capable of managing heterogeneous collections of metadata records while exposing services for mapping and transforming from one metadata schema to another. MINT services compose a web-based platform that was designed to facilitate aggregation initiatives for cultural heritage content and metadata in Europe. It is employed from the first steps of such workflows, corresponding to the ingestion, semantic alignment and aggregation of metadata records, and proceeds to implement a variety of remediation approaches.

An aggregation infrastructure such as the MINT Ingestion tool offers a crosswalk mechanism to support the subsequent activities:

- a) harvesting and aggregating metadata records that were created using proprietary metadata schemas;
- b) migrating from providers' models (whether standard or local) to a reference model;
- c) transforming records from LIDO, the harvesting schema for the DCA project, to the *Europeana* Semantic Elements and the *Europeana* Data Model.

In the framework of the DCA project meetings, NTUA organised tutorials for the MINT tool, focusing on the mapping procedure and transformation of partners' metadata. The mapping procedure was presented step-by-step, emphasising the recommended fields that the DCA content partners could provide in order to obtain good search possibilities. Special mention was given to the opportunity for DCA content partners to submit full and rich metadata records through the MINT tool and transform them by using LIDO schema to ESE schema and in the future to EDM schema. The DCA content partners could download each of these schemas for private usage. In addition, a DCA aggregation support mailing list was created to discuss issues such as the use of the MINT tool, the required file formats and the submission of records with many resources and mapping issues.

Analytically, the process of gathering the collection of metadata from DCA content partners through common data delivery protocols, such as OAI-PMH, HTTP and FTP or uploading CSV, TXT or XML file, is provided by the MINT ingestion tool. Semantic interoperability is a

requirement that supports the ability of a retrieval system to query fields with the same or similar content in different data sources supporting cross-domain searching. The main approach to interoperability of cultural content metadata has been the usage of well-known standards in the specific museum, archive and library sectors (Dublin Core, CIDOC CRM, LIDO, EAD, METS) and their mapping to a common data model used¹⁹ to provide unified access to cultural content which is centrally accessed and distributed all over Europe.

The standardisation of the file formats and metadata that have been produced within the DCA project conform to the Lightweight Information Describing Objects (LIDO) schema that is able to represent rich information. LIDO is a pure harvesting metadata model that is used to deliver metadata on museum objects in a service environment, like for example portals, harvesters and online collection databases. LIDO represents the full range of descriptive information about museum objects and is based on CDWA Lite, CIDOC-CRM, museumdat, and SPECTRUM. LIDO itself is quite a large data model, providing fine-grained descriptions of museum objects while supporting multilingual environments. In addition, individual content providers can decide on how light or/and how rich they want their contributed metadata records to be. By using LIDO the content providers can deliver data and resources / digital surrogates relating to their objects and include links from contributed metadata back to records in their 'home' context. LIDO also allows for references to controlled vocabulary and authority files. Metadata are made available by the DCA content partners with the help of their metadata schema mapping to the LIDO schema using the MINT tool. Users can register and access the services at <http://mint-projects.image.ntua.gr/dca>

Mapping metadata elements constitutes a crosswalk for transformation from one metadata schema to another. A meaningful mapping is achieved, presupposing that the metadata elements in each schema are clear and are precisely defined. Mappings can be applied to ingested records, edited, downloaded and shared as templates. Users' mapping actions are expressed through XSLT style sheets, i.e., a well-formed XML document conforming to the namespaces in XML recommendation. XSLT style sheets are stored and can be applied to any user data, exported and published as a well-defined, machine understandable crosswalk that can be shared with other users to act as template for their mapping needs.

The metadata transformation process from the content partners' metadata to the DCA Schema (i.e., LIDO) is very important for the creation of rich and meaningful metadata. Users can transform their selected collections using complete and validated mappings in order to publish them in available target schemas for the required aggregation and remediation steps.

In order to extend the functionalities of the Ingestion tool with the OAI-PMH protocol and thus expose metadata through an interoperable mechanism, the defined OAI-PMH verbs were

¹⁹ At the Europeana level: European Semantic Element (ESE) (Europeana Semantic Elements), European Data Model (EDM) (Europeana Data Model).

implemented on top of the underlying and domain-specific data layer. The resulting repository offers an OAI-PMH interface exposing the records in the *Europeana* Semantic Elements schema. The use of a reference model allowed for the rapid support of updated ESE versions with minimal input from providers. User efforts to align their data to an adopted domain model motivated them to update their collection management systems and improve the quality of their annotations in order to take advantage of a well defined, machine understandable model and, subsequently, control and enrich their organisation's contribution and visibility through *Europeana*.

On the Web, the exchange of data occurs through the exchange of documents. XML is a document format, especially designed for describing and exchanging (meta)data on the Web so that computers can understand it. Even RDF has a serialisation into RDF/XML for exchange on the Web. For this reason, special attention went into producing best practices for generating XML documents.

As mentioned before, XML is a document format designed for describing metadata and exchanging it on the Web as a document, and exploiting the Web architecture, not for displaying it to the end-users. It is an open W3C standard that is self-descriptive and machine-friendly, platform-independent, which allows for one to define one's own vocabulary (set of tags) in order to describe metadata. XML has some basic syntax rules to structure and describe one's metadata.

Alongside XML, is XML schema. XML schema formally describes the structure of an XML document and defines the used data types in the document. An XML schema is used to validate XML documents. An XML document is well-formed if it follows the syntax rules of XML; it is valid if it conforms to its XML schema.

XSLT is an XML technology for performing XML mappings. It transforms data from one format to another (e.g., XML to XML, XML to RDF, XML to HTML). Another XML technology is XLink. It is used for linking in XML documents. XQuery is a technology for querying XML documents and XPath and XPointer are used for referring XML elements.

XML is a popular technology on the Web because it is simple to use, generic and well accepted by the community. Furthermore, there are many freely available tools to support XML operations and many metadata standards have been formalised in an XML schema.

2.4.3. Aggregation and ingestion trajectory

The aggregation and ingestion workflow involves the following procedures²⁰:

1. Providing export of the data to be aggregated: depending on the chosen aggregator, such an export could take the form of a CSV or XML file, or could be harvested by the aggregator based on the OAI-PMH protocol. In parallel to this, the digital reproductions and metadata should be made available in an online environment and retrievable via a direct link²¹.
2. Technically providing the metadata and pertaining URLs²² to be aggregated: the delivery (ingestion) of the export, or its 'harvesting'²³ might differ from one aggregator to another. It is up to the partner to check how this needs to be done, and rely on the technical DCA partners²⁴ in case provision of the data is unclear.
3. Matching the data export to the aggregator's metadata scheme: in the case of MINT, the partners themselves can attribute their metadata fields to the LIDO scheme by using the MINT mapping editor. In other cases, the aggregator will do it. In such cases, the task of the contributing partner might be to indicate the preferred mapping²⁵ on a conceptual level; the aggregator then takes care of the actual implementation of the proposed mapping.
4. Actions on the side of the aggregator: taking in the data, transforming them according to the mapping scheme that might (or might not) be provided by the content provider, storing the (transformed) data and notifying *Europeana* when the data is ready to be transmitted.
5. Publication of the data: depending on the aggregator, this might happen only on *Europeana* or also on the aggregator portal website. In both cases, this step is the responsibility of *Europeana* or the aggregator alone. It is outside the scope of DCA's Grant Agreement and the duration of this step will depend on the ingestion workload waiting for *Europeana* or the aggregator team.

On the basis of this trajectory, a schedule was developed which was sent to *Europeana* in order to prepare their side of harvesting.

²⁰ It should be noted that some of these procedures might happen in parallel. Each aggregator might follow its own workflow in this (e.g., requiring that the content partner make a mapping on a conceptual level even before any data is provided to the aggregator, or vice versa). Therefore the numbers of different procedures do not necessarily indicate a logical order.

²¹ For those partners who did not have an own institutional website, the LIDO Viewer was provided by DCA partner UBITECH.

²² For example leading to previews and the partner's own website.

²³ This is when the data gets pulled into the aggregator back-end repository, for example in case of an OAI-PMH harvesting.

²⁴ Or external servicing parties, e.g., database providers.

²⁵ I.e., clarifying to the aggregator which metadata field on the provider's side will match which metadata field on the aggregator's side.

2.4.4. Legal issues

At the start of the DCA project and the Commission's approval of the Technical Annex / Description of Work, *Europeana* governed the use of the delivered metadata by means of the *Europeana Data Provider* and *Europeana Data Aggregator Agreements*. On September 22, 2011 *Europeana* communicated that on January 1, 2012 the new *Europeana Data Exchange Agreement* (DEA) would replace the *Europeana Data Provider Agreement* and the *Europeana Data Aggregator Agreement*. The DEA now governs the rights on the data that is delivered to *Europeana*. Since the supply to *Europeana* of the links to the digital reproductions and their metadata is an essential outcome of the DCA project, decisions on the changing conditions of the material's by *Europeana* and/or third parties directly affect the DCA project.

Some elements of this 'new' agreement deserved special attention and needed to be brought to the attention of the DCA content partners. Whereas the previous agreements only allowed for non-commercial use of the delivered data and guaranteed source attribution, the DEA also allows for commercial use of the metadata and does not guarantee source attribution outside the *Europeana* portal.

In order to make the partners aware of the DEA and its content, a dedicated IPR workshop was held as part of the plenary DCA meeting in Porto (21-22 September, 2011). Two legal experts were invited:

- Joris Deene (Belgium, lawyer associated with 'Samenwerkingsverband Auteursrecht en Samenleving')
- Manuel Martinez Ribas (Spain, lawyer associated with FTAPIES).

Joris Deene explained the general European legislative copyright framework in relation to making content available on the Web, with a particular focus on the legislation of each DCA partner country. Manuel Martinez Ribas illustrated how FTAPIES had in the past dealt with IPR issues and related obstacles. Subsequently, the DEA itself and its implications for delivery of content to *Europeana* in the context of the DCA project were presented and discussed. Each content partner would afterwards decide for itself how this would affect its delivery of data to *Europeana*. What became immediately clear is that there was a greater reluctance to provide rich, meaningful data to *Europeana* than was anticipated under former agreements.

Consequently, an IPR task force was created. This group worked on formulating a shared point of view from the DCA consortium on the recent evolutions in the DEA policy of *Europeana*. This was then communicated to Jill Cousins with the approval of all DCA partners.

An internal document on how to deal with the DEA, including for example the metadata filtering options that were provided via MINT, was made available on the DCA's internal communication platform. In addition, a presentation on the *Europeana* portal rights statements was given. It explained the different rights statements that could be applied by the partners to indicate the

regulations on their original objects, their metadata and the digital preview that is provided to *Europeana*.

3. Towards enhanced query results

The main goal of LOD is to let people share structured data on the Web as easily as they share documents today. It refers actually to a style of publishing and interlinking structured data on the Web. The main recipe for LOD is RDF (RDF Primer), the Resource Description Framework. The structured data is published as RDF data (using a RDF data model) and RDF links are used to link data from different data sources. This way, the LOD on the Web creates a giant global graph, where all published data is connected to each other, also called the Web of Data. In this Web of Data, clients can easily discover, query and consume data.

Two deliverables therefore focussed entirely on LOD:

- *D5.3 Enrichment module and POC*;
- *D5.4 Semantic dissemination to Europeana*.

Deliverable *D5.3 Enrichment module and POC* gives a detailed overview of LOD. It pays special attention to the enrichment module, which will interlink the artwork descriptions to external resources. The LOD principles were demonstrated very practically by a proof of concept that publishes the DCA content as LOD. It shows the benefits of interlinking one's data, as a way of creating more contexts for the artwork descriptions.

Deliverable *D5.3 Enrichment module and POC* also discussed how to publish data as LOD in practice. LOD stipulates four basic principles:

- the first is that to start one has to identify the items of interest in our domain. Those items are the resources, which will be described in the data;
- the second principle is that those resources have to be identified by HTTP URIs and avoid schemes such as Uniform Resource Names (URNs) and Digital Object Identifiers (DOIs);
- the third principle is to provide useful information when accessing an HTTP URI;
- the fourth rule is to provide links to the outside world, i.e., to connect the data to other datasets in the Web of Data. This makes it possible to browse data from a certain server and receive information from another. In other words, by linking the data to other datasets, the web becomes one huge database, called the Web of Data.

We showed how to do it, which steps to take and which open source tools to use for the different steps. The basic steps in publishing one's data as LOD are:

- select an appropriate RDF model to publish the data;
- choose a LOD server infrastructure;
- transform the data to RDF;
- enrich the data.

Each of the steps were discussed in detail and demonstrated by our proof of concept. For each we also provided a list of open source tools and schemas that help complete these steps. As such, we were able to give a broad overview of LOD, and to go a little deeper into the technical details of setting up a LOD server. An important step in publishing LOD is to enrich the data. In deliverable *D5.3 Enrichment module and POC*, special attention went to the enrichment module. Finally, we ended with a workflow recommendation for the DCA partners to publish their data as LOD.

In deliverable *D5.4 Semantic dissemination to Europeana* we provided more details on how the aggregated metadata of the contemporary art partners can obtain a semantic binding. The latter is actually a semantic representation of the harvested contemporary art records. Most DCA content partners will use MINT for aggregating and mapping their data. To do so, they mapped their data already to LIDO. Another major aggregator used by the DCA partners is GAMA. GAMA is an aggregator for media arts. They use their GAMA model to describe the media art instances. The GAMA model is already a semantic model. Because *Europeana* employs the EDM model as a semantic model for publishing their artwork descriptions as LOD, we focussed on mapping both LIDO and GAMA to EDM, assuring the harvested records have a common semantic binding.

To define the mapping, we started from the field list provided in deliverable *D3.1 Metadata Implementation Guidelines for Contemporary Art*. This field list was developed to support the mapping of the content providers. All fields in the list should be taken into account when mapping. The list is resource-based to enhance the interlinking of the resources in a later phase. It also formed the basis for the LIDO application profile for contemporary art and an EDM application profile.

When mapping LIDO to EDM, the application profiles are considered for the process. LIDO is an XML schema. The technology used for performing the mapping is XSLT. As GAMA is already a semantic model we provided an alignment ontology, using SKOS for aligning the two models for the mapping from GAMA to EDM.

4. Supporting tools

4.1. Digitisation plan

The fact that digitisation serves a long-term purpose and is rather resource-intensive often relays this activity to the lower end of the priority list of projects within contemporary art organisations. Often a specific event is used as an opportunity to get some of the parts of the collection or archive digitised. In these cases, time and budgets are restraints that lead to rough planning methods.

The DCA project was for many of its content partners the first project that allowed them adequate time for preparing and planning digitisation. A tool that was developed during the first project phase supported this process: the 'digitisation plan'. This is a template document that began with an outline of the digitisation workflow to emphasise the importance of all phases beyond the actual creation of a digital file. This outline helps to include all necessary work and to structure the task schedule. Next followed a GANTT chart to show the implementation schedule of the different work phases. Although this was preceding the details on the segment, it was to be created last, when all details had been determined. The next part asked the partners to describe 'segments', i.e., requesting them to consider how to structure their work with the collection, taking different parameters into account such as:

- accessibility of the physical objects (e.g., external storage, packed items, exhibition objects and objects on loan and in-house storage);
- mode of digitisation (e.g. scanning and reproduction photography);
- executing team (e.g., own in-house staff and various subcontractors);
- availability (e.g., in-house, or transport requirements, assemblage requirements or special lighting situations, specialist set-up team requirements and artists' requirements too);
- equipment availability (e.g., in-house, the subcontractor working in-house and equipment requirements in external location).

Next we asked the partners to give pertaining information on the technical specification of the items to be digitised (original object) and of the targeted technical specification for the master files and (if applicable) for the derived files.

This request forced the DCA content partners to research the technical description or specifications of the original 'to-be-digitised' object and to think about the different quality options for the targeted digital masters and derived copies. The benefit of this is that they are not unprepared for negotiation with potential subcontractors, or can even insist on a quality level they have investigated during creation of the digital plan. Knowing that there is a lack of know-how and experience, especially video and sound art, we attached information on the technical options for master files in an annex.

The digitisation plan is a tool to help one consider all aspects related to digitisation. However, often the digitisation plans needs to be adjusted during the course of a digitisation project. This might be due to unexpected findings during the assessment of the physical collection or archive and to factors that take priority over digitisation (e.g., a request for a loan of a specific item for an exhibition planned after setting up the digitisation plan, plans for moving the collection or archive, or change of curator during the course of the project). There are also many unforeseen elements that require the digitisation plan to be malleable. This in turn harbours the danger of being too quick to adapt the plan to the reality rather than sticking to it and dealing with problems in such a way as to be able to continue with it.

Insofar, the lesson learned is on both sides:

- for the management, it is obvious that one needs to remain open and understand that the digitisation plan is made before knowing all facts, otherwise it would be superfluous;
- for the curators, it is obvious that a plan makes sense as it structures a project and helps one consider a range of options, risks and opportunities.

Keeping the digitisation plan flexible while taking it seriously and attempting to keep the timeline and quality proposed as long as possible is the lesson learned.

4.2. Progress monitoring tools and quality specification control

Over a period of 30 months, 27,671 items that were high quality reproductions of diverse types of contemporary artworks and contextual documents were produced. Obtaining this target with a heterogenic consortium required intensive support and guidance from the project management, in the first place by sharing knowledge and experience (workflow and best practices, see paragraphs *2.2 Establishing the digitisation workflow* and *2.3 Sharing knowledge and best practices*), in a second phase by maintaining contact and communication through periodical supervision activities and meetings. Each content partner was responsible for its own digitisation performance, the compliance of its work and results with the Description of Work and the targeted quality of its digital reproductions. Consequently, the supervision could only take place in the form of remote, structured monitoring.

The tool developed to monitor the progress of each content partner was a document named the Digitisation Status Report. Every four months, starting with month 10, the report was delivered to WP4 leader MRBAB-KMSKB. It requested information about the progress of the digitisation by comparing the total amounts expected (minimum as indicated in the Description of Work) and the amount of digitised and archived masters, the creation of metadata, the processed metadata available online and the copyrights cleared so far. To get an overall status of the digitisation in terms of quantity and timing, these reports were assessed by comparing them with the initial digitisation plan and the Description of Work. Any discrepancy between the amounts and deviation from the schedule had to be commented. Sometimes the digitisation plan could be adapted to a new situation, a procedure that involved both the project management and

digitisation supervisor. The tool encouraged the content partners to assess their own progress and reorganise their work when it became clear that they were no longer on track.

Several reasons for deviation emerged:

- some artworks unexpectedly left the museum for an external exhibition;
- some artworks could not be handled solely by the museum staff (due to weight) and an extra budget for a transport firm was not available;
- the process to appoint a subcontractor took much longer than expected;
- the subcontractor did not deliver the files in time;
- the subcontractor did not deliver what was promised;
- the artworks were too big to be scanned;
- the delivered scanner had other measurements than indicated, and as a result the selection of items to be scanned had to be reviewed and even photographed instead;
- some artworks had already been photographed in the interim period between the creation of the Description of Work and the project start;
- some artworks turned out to be too fragile to be photographed;
- some artworks needed restoration before any possible action and a restoration budget was not available;
- some items could not be traced in the storage rooms;
- the inventory of the physical collection and/or archive took much longer than foreseen;
- the inventory of the collection and/or archive made clear that several artworks dated from before 1945 (and there was no metadata in the collection database system available to find this out in advance);
- the search and selection of the master (in case of media art) took longer than expected;
- clearing the copyrights took much longer than planned;
- unexpected relocation of the content partner (or collection or archive) interfered with the digitisation process.

Such examples show that the preparation phase of a digitisation project cannot be underestimated. It is impossible to exclude unforeseen circumstances but a lot of surprises can be prevented through a good preliminary selection and investigation of the objects to be digitised. This includes a preliminary verification of its metadata and an examination of the objects in situ preliminary to the start of a digitisation project.

The quality of the digital reproductions was monitored through the assessment of representative samples (master files from different types of artworks and contextual documents, and made by different subcontractors). A visual examination took place in combination with the use of tools for verification of the technical and administrative metadata and the validation of the file formats (Exiftool²⁶ and Jhove²⁷). The quality check of the digital images revealed important shortcomings

²⁶ The Exiftool is a metadata editor for technical and administrative metadata of digital files.

²⁷ The open source tool Jhove enables one to identify and validate the format of a digital object in order to avoid archiving risks.

in some cases, for instance blurred images, incorrect colours, sloppy and alternating background and worn colour cards. For video the most common problem was a deviating image aspect ratio. In one case wrong equipment was used: an S-VHS tape was played in a VHS player.

The digitisation plans assessed provided clarity on the technical data but despite that, some partners were using the wrong colour profile (e.g., an sRGB for the master file) or a resolution that wasn't adapted to their needs or equipment (e.g., a resolution that was too high). In some cases the pixel size of videos differed from the original plan, due to the norm of the hardware used.

The visual analysis in combination with the technical requirements preconceived in the digitisation plan made it possible to adjust where necessary. Each monitoring was followed by detailed feedback from the supervisors (MRBAB-KMSKB and for video works NIMK/LIMA) to inform the involved DCA content partner.

It is clear that each type of artwork or contextual document needs its own approach. The digitisation cannot be carried out without the advice of a conservator. He/she is the only person who can decide how an object has to be reproduced, taking into account the specific goals of digitisation. Reproducing an artwork or contextual has to contribute to a better understanding of it. In some cases it is very important that the look and feel of an artwork (e.g., materials and details of relief) can be communicated through the image (e.g., in the case of certain artists' books). For video, a technician with good knowledge of vintage video equipment and their video and audio signals is needed to judge if a digital version contains all aspects of the analogue original.

Originally some DCA content partners had a certain resistance against using a full digital method (i.e., using a digital camera instead of photographing on reversal film and scanning the resulting slides afterwards). This was partly due to the fact that the digital preservation of the resulting files would be a completely new field for them. Through collaboration within the DCA project and the good experiences of other DCA content partners they decided to change to a full digital method.

At the end of the DCA project each content partner had reached the highest possible level of digitisation within the reach of its budget. The expertise and experience acquired is a good starting point for future individual digitisation projects.

4.3. The MINT tool and tutorial

The MINT tool is a web-based open-source platform enabling the aggregation of rich and divergent cultural heritage metadata. It has been developed within the framework of the European project ATHENA with the aim of aggregating material to *Europeana*. MINT has been

deployed in projects dealing with cultural material from libraries, archives, museums, galleries and the audio-visual sector.

The MINT tools can be used for ingestion, mapping and aggregation of metadata records, and implements a variety of remediation approaches for the resulting repository. The MINT tool serves the ingestion of semi-structured data and manages crosswalks to the reference schema in order to take advantage of a well-defined, machine-understandable model. The underlying data serialisation is in XML, while the user's mapping actions are registered as XSL transformations. The common model functions as an anchor to which various data providers can be attached and become, at least partly, interoperable.²⁸

The key functionalities include:

- organisation and user level access rights and role assignment;
- collection and record management (XML serialisation);
- direct import and validation according to registered schemas (XSD);
- OAI-PMH based harvesting;
- visual mapping editor for the XSLT language;
- transformation and previewing (XML and HTML);
- repository deployment and remediation interfaces.

The DCA partners have the MINT Tool at their disposal. The metadata ingestion workflow for DCA Ingestion Server consists of four main steps:

1. harvesting/ delivery;
2. schema mapping;
3. transformation;
4. publishing.

The handbook (in deliverable *D5.2 Ingestion guidelines and tutorials for data mapping and aggregation* and the online documentation

http://mint.image.ece.ntua.gr/redmine/projects/mint/wiki/User_manual) presents the MINT mapping tool functionality. It is divided into four sub-sections that correspond to the main actions that a content provider has to perform before submitting its content to *Europeana*:

- user organisation and registration;
- imetadata import;
- mapping;
- transformation – publication to Europeana.

²⁸ N. Drosopoulos, V. Tzouvaras, N. Simou, A. Christaki, A. Stabenau, K. Pardalis, F. Xenikoudakis, E. Tsalapati and S. Kollias "An aggregation system for cultural heritage content" CIDOC Conference, September 2011, Sibiu, Romania

4.4. The score model for digital sustainability

Digital sustainability is a concern for any organisation investing time and money in digitisation, and subsequently preserving the digital files. Unfortunately, digital files are vulnerable: hardware ages, errors can be made when copying files and file formats can become unreadable in the future. On top of which there is always the possibility that the integrity of digital files is affected as a result of human errors.

In 2012 DEN (Digital Heritage Netherlands) and DCA project leader PACKED developed the website www.scoremodel.org. This score model for digital sustainability helps heritage institutions to map the possible risks and threats that may occur when using and storing their digital collections. The result of the use of the score model is a report that brings out the strong and weaker points of the way the institution has organised its digital collection. Recommendations on how to minimise such risks are provided where possible.

The possible risks are grouped in seven clusters:

- Organisation and policy: does the preservation of digital files fit the structure and policy of your organisation?
- Preservation strategy: has a system been set up to correctly register what is being preserved, for whom and how?
- Expertise and organisation: is the right expertise present in your institution and is it put to good use?
- Storage management: are the digital files stored in a reliable place?
- Ingest: are the right measures taken whenever a digital object is ingested into your storage system? Has any kind of procedure been developed for ingesting digital objects into your storage system?
- Planning and control: is the management well prepared? Is it possible to retrace all the actions that are and have been taken?
- Access: is access to the digital files properly regulated?

It is important that users of the score model for digital sustainability address the risks in a systematic way. First, for each cluster they have to start by trying to get out of the 'red zone'. Taking some targeted measures can already eliminate often major threats. In a next phase some less urgent measures can be taken. This way, the safeguarding of the digital collection will grow systematically until an acceptable level of security is achieved.

Within the framework of the DCA project, PACKED produced an English version of the score model for digital sustainability. All DCA content partners were asked to test and use this English version. In this way the score model made the DCA content partners more familiar with the digital sustainability threats, and their comments helped PACKED to test the score model. In the 'Documents' section on www.scoremodel.org the two DCA deliverables on long-term sustainability (*D6.1 Guidelines for a long time preservation strategy for digital reproductions and metadata* and *D6.2 Best practices for a digital storage infrastructure for the long-term*

preservation of digital files) have been made available as a background for all users of the score model.

5. Achieved results

5.1. Aggregated content

Europe has a large amount of outstanding museums and other collecting institutions of contemporary art. Each one has acquired the artworks of its collection on the basis of the outstanding creativity, skill or workmanship demonstrated by the work. The artworks have also often been given much critical praise.

A combination of several criteria has been used for the selection of the masterworks for digitisation within the framework of DCA. It would be impossible to justify the selection of each individual artwork here, but the criteria that have been used will be illustrated with some examples.

1. The selected artworks carry an inherent cultural, historical, artistic or scientific value, visible to European citizens.²⁹
 2. The collecting institutions consider the selected artworks as most representative of their collections.³⁰
 3. The selected artworks have a special value for the collective memory; it brings up clear memories of persons, events or traditions that are important for the culture and history of Europe as a whole.
 4. The selected artwork indicates an essential phase in the oeuvre of an artist or an entire art movement.³¹
1. Preference has been given to works that are truly unique.³²

²⁹ Example: the works that MMSU has selected for digitisation have a representative status within the Croatian contemporary art scene and reveal initial points and logical developments of certain artistic tendencies, parallel to the development of art in Europe and the rest of the world.

³⁰ Example: the selection of content by AE is, for example, based on the history of the Prix Ars Electronica, one of the most important awards in the world for creativity and pioneering spirit in the field of digital media (art). The Prix ARS Electronica has been awarded since 1987 by AE and the regional branch of the Austrian public broadcast organisation ORF during the yearly ARS Electronica Festival. The ARS Electronica institution and collection is closely linked to the ARS Electronica Festival and the Prix ARS Electronica. It is AE's intention to represent all winning projects of the Prix ARS Electronica, from the award of the first Golden Nica in 1987 until now.

³¹ Example 1: MMCA has selected the sculptures of Achilleas Aperghis that form a sculptural unit of the decade 1960-1970.

Example 2: FTAPIES digitised a very specific part of the oeuvre of Antoni Tàpies: the artist books. They are considered by international experts as masterpieces bringing together the visual creation of Antoni Tàpies with the most avant-garde literature in terms of European and worldwide poetry and thinking. The artworks combine the most daring experiments in terms of graphic work with the work of authors such as Ramon Llull, Joan Brossa, Octavio Paz, Edmond, Jabés, Maria Zambrano, Shuzo Takiguchi and Jorge Guillén. More than simple artist books, these publications are considered as the gathering of artworks. Each page of these artist books should be considered as an artwork in itself.

³² Example: MMCA has decided to focus its digitisation activities mainly on sculptures and installation. It has selected certain exceptional and characteristic works in order to allow an original reading of the generations from the 1960s until today. The Greek artists whose work has been selected for digitisation have marked the artistic life of the Greek country and have taken Greek art away from the constraints of its borders into the international artistic scene, allowing younger generations to build upon this rich tradition.

Some artworks by the same artist are selected from collections of several institutions, often based in different European countries. Thanks to the digitisation and contextualisation, these can easily be linked in an online environment like *Europeana*. In some cases also a whole body of works by one single artist has been selected, including contextual documents that belonged to the archive of the artist him/herself.³³ These selection decisions will lead to a better understanding of the value of certain artists and contemporary art in general for our European cultural heritage.

The DCA project is aimed at contemporary art that is created within different art disciplines. Different types of material shape the work of contemporary artists: visual (e.g., paintings, photographs and sculptures), audio-visual (e.g., video, installations and performance), audio (e.g., sound works) and even text (e.g., artist books).

DCA's digitisation procedures gave special attention to contemporary art types that prove to be very challenging in terms of the technological methods as well as the art theory issues regarding their digitisation (such as time-based art, installation art, interactive art contemporary artworks).

A large number of the selected artworks need to be digitised in order to make them accessible (once again) for the audience.³⁴

The digitisation activities that were developed in order to make the work accessible through *Europeana* were often in synergy with other activities undertaken by the collecting institutions.³⁵

The selection of artworks contains works from well known and lesser-known artists, from old and young artists.³⁶

³³ Example 1: HFG focussed its digitisation solely on the archive of the artist Stephan von Huene.

Example 2: FTAPIES focussed its digitisation on the artist books of Antoni Tàpies.

³⁴ Example 1: the artist books (e.g., the ones by Antoni Tàpies) are, for example, too vulnerable to make them accessible for a large audience. Digitisation makes it possible for the audience to consult the books page-by-page and detail-by-detail. This was impossible before.

Example 2: the artworks on paper from MRBAB-KMSKB are almost never displayed in an exhibition context. They are very fragile and are mostly kept in a storage room, where they can be accessed by the museum staff but not by the audience. Digitising and making the works available through a website (e.g., museum's website or *Europeana*) is the only way to make these artworks visible for a broader public.

Example 3: a large amount of the master tapes of the video works that, for example, ARGOS and NIMK/LIMA digitised currently only exist in analogue formats that are rapidly becoming obsolete due to the technological evolution. They can only be preserved and kept accessible through digitisation.

³⁵ Example: WRO has selected masterpieces by Polish and internationally acclaimed artists among the media performances and installations from their archive. Both genres are the subject of their research for the purpose of the next issue of their multimedia publication series (*Widok. WRO Media Art Reader, vol. 3*). The previous two *Widoks* (always a book and DVDs) were devoted to the history of experimental cinema and media art (*From Absolute Cinema to the Film of Future*) and to the oeuvre of Nam June Paik. Now they are researching their (and other) archives to prepare the next *Widok* devoted to media installations. They found this synergy effect with the current curatorial practice of WRO very natural and valuable.

³⁶ Example: SERRALVES finds it important that the DCA project doesn't forget artists who are less-known, but still stand out for their quality, for the story told through their art and for the way they so often purposely alienate

Contemporary art organisations do not only hold artworks, they also collect and create a large quantity of valuable contextual information. An important part of objects to-be-digitised are considered to be 'contextual documents'. These can contribute to a better understanding of contemporary art as a form of cultural heritage.

For some artworks (e.g., ephemeral time-based art forms like performance), this contextual documentation is the only thing that can easily be made permanently accessible to the audience.³⁷ Video registrations of temporary artistic events have a status of their own in the field of media art. Live performance³⁸, but also some installation works can in many cases only be experienced during electronic art festivals, temporal exhibitions at media institutes or in a club scene. To conserve something of these ephemeral events, and to create something that reflects or documents these works, photography, film or video is used. These media are employed to make it possible to analyse the acts, to promote the works or to place them in a historical context. Within the visual arts the documentary recording becomes increasingly important. It can become as important as, or even more important than the live project itself.

It is sometimes also impossible to make a clear distinction between what is the artwork and what is the contextual document. In some cases the contextual document acquires the status of an 'artwork' over time-

Every institution also produces its own catalogues and other publications about its collections and exhibitions.³⁹

5.2. Documentation

5.2.1. Published guidelines

The DCA project produced several guidelines in the form of public deliverables. All deliverables are available on the DCA website (<http://www.dca-project.eu/>). In general, the guidelines focus on three different areas:

- metadata practices (metadata creation, contextualisation and enrichment);

from the most common art circuit. This approach is reflected in their selection. They aim is to share the work of other artists who are not yet known by the general public.

³⁷ Example: LIMA has provided video registrations of ephemeral artistic events such as performances, installations and happenings.

³⁸ Example: the series of performances by Marina Abramovic of which NIMK/LIMA has digitised the video recordings.

³⁹ Example: the catalogues of RAM contain art historical texts on and images of the artworks. They show the transition that Icelandic art has gone through since 1945. They also show the history of the museum which since 1973 has gone from one museum to three museums that represent all Icelandic art with an emphasis on contemporary art and the three greatest Icelandic artists: Erró, Jóhannes Kjarval and Ásmundur Sveinsson.

- digitisation;
- digital preservation.

Within the DCA website, a wiki is offered (see paragraph 6.2 *Living document of guidelines*) containing all guidelines. The DCA wiki has three subsections, according to the three areas the guidelines were produced for:

- a section on metadata creation, contextualisation and enrichment;
- a section on digitisation of contemporary art;
- a section on the digital long-term preservation.

The deliverables that form the base of the DCA wiki are:

- *D4.2 Guidelines for an A-Z digitisation workflow for contemporary art works;*
- *D3.1 Metadata implementation guidelines for digitised contemporary artworks;*
- *D3.2 Recommendations on contextualisation and enrichment of contemporary art;*
- *D5.3 Enrichment module and POC;*
- *D5.4 Semantic dissemination to Europeana;*
- *D6.1 Guidelines for a long time preservation strategy for digital reproductions and metadata;*
- *D6.2 Best practices for a digital storage infrastructure for the long-term preservation of digital files*

Deliverable *D3.1 Metadata Implementation Guidelines for Contemporary Art* is a very general deliverable, giving a broad view on metadata. It produces metadata implementation guidelines for documentation purposes and guidelines for dissemination (exchange) purposes for the contemporary art sector. Here, the guidelines firstly target the participating contemporary art museums and collecting institutions, but also users from the broader fields, and then just contemporary art. The guidelines provided can be generalised to the cultural heritage sector.

Deliverable *D3.2 Recommendations on contextualisation and enrichment of contemporary art* gives an introduction to the Semantic Web and produces guidelines (a contextualisation path) for disseminating five star LOD, i.e., fully contextualised. Alongside these guidelines, the deliverable also provides an introduction to SKOS for describing controlled vocabularies and a formalised contemporary art SKOS vocabulary. This deliverable targets the participating contemporary art institutions and collecting institutions. The introductions to the Semantic Web and SKOS are also suitable for the broader audience. No technical expertise is expected from the audience in this deliverable.

Deliverable *D5.3 Enrichment module and POC* describes the process of publishing LOD from a more technical point of view. It also provides a list of models and open source tools that can contribute to this step. This deliverable is meant for those participating institutions and collecting

institutions wanting to learn about LOD, to publish LOD or to prepare for publishing LOD in the institution.

Deliverable *D5.4 Semantic dissemination to Europeana* assures that the harvested records can have a semantic binding. EDM was chosen for this process. As such, the project anticipates the use of EDM within *Europeana*. To do so, the deliverable provides a mapping from LIDO to EDM in the form of an XSLT mapping and from GAMA to EDM in the form of an alignment ontology. With this semantic binding, EDM records can be delivered to *Europeana* the moment they start to use the EDM model as a default input model. Both mappings are useful for contemporary art institutions and collecting institutions. The LIDO2EDM xslt can in fact be used for any institution wanting to deliver EDM records to *Europeana* in the future instead of LIDO records. The GAMA-EDM alignment ontology is suitable for institutions using the GAMA model at the present time, but wanting to export EDM records. This specifically targets media art institutions.

Deliverable *D4.2 Guidelines for an A-Z digitisation workflow of contemporary art objects* provides guidelines and parameters for the digitisation of contemporary artworks and contextual documents. This public document caters for a larger target group than the DCA content partners: it was conceived as a set of guidelines that could serve as a reference to collection caretakers when they consider the digitisation of a collection of contemporary artworks and/or contextual documents. When preparing *D4.2 Guidelines for an A-Z digitisation workflow for contemporary art works* the writers collected feedback from all collection partners regarding the difficulties they encountered during the process of digitising their collections. The documents also benefit from the support of a Media Art Group that was set up within the course of the project, in order to provide extra input on the digitisation of media artworks. *D4.2 Guidelines for an A-Z digitisation workflow for contemporary art works* stresses that digitisation does not only mean the actual conversion from analogue to digital, but refers to the whole chain of action that starts by determining the initial digitisation goals and creating a digitisation plan, to the actual quality control and long-term preservation of the resulting digital files. It provides in-depth information about the quality parameters of the files (e.g., resolution, bit depth and colour space), and about the process of digitisation (e.g., equipment, lighting, colour management).

D 6.1 Guidelines for a long-term preservation strategy for digital reproductions and metadata describes the relevant results from the project and research related digital preservation. It explains how to preserve digital content such as text, images and video. It provides a theoretical introduction to the subject as well as practical examples of how to manage a collection of digitised and born-digital artworks.

D6.2 Best practices for a digital storage infrastructure for the long-term preservation of digital files focuses on bit preservation, i.e., the physical storage of the data and how today's institutes and companies store their collections of data. It gives an overview of storage media types and systems available for creating a good storage infrastructure. The best practice can be used as a guideline for those in charge of maintaining contemporary art collections, digital archives, in the

event of buying new equipment or when making a preservation plan. Storage is defined in this deliverable as a hardware media on which one can store digital content. In more strict preservation terms a digital storage infrastructure for long-term preservation can be seen as the Archival Storage entity in the OAIS (Open Archival Information System) model. Archival storage is a storage infrastructure, which provides the means to store, preserve and access digital content.

5.2.2. Case studies and interviews

As part of the DCA project, project leader PACKED interviewed some of the content partners:

- WRO;
- FTAPIES;
- TM;
- MRBAB-KMSKB;
- MBVB;
- ARGOS;
- MU.ZEE.

Extensive text versions of these interviews were published in the ‘Documentation’ section of the DCA website. The interviews were published to inform the general audience about the work of the DCA content partners, and about the challenges and opportunities that the DCA project created for them. They also inform other collecting institutions about the complexities of large-scale digitisation projects, and to deal with these. Each interview has a slightly different focus and is illustrated with pictures. All interviews are published in English. The interviews with MBVB, ARGOS and MU.ZEE are also available in Dutch. The interviews with TM, ARGOS and MU.ZEE are also published on www.scart.be (a website on audio-visual heritage by PACKED). The interviews also offered the interviewed content partners the possibility to publish the text on their own website or to create an additional link from their website or social media to the DCA website. The publication of the interviews was also featured in a newsletter published by DCA partners, and by external organisations (e.g., INCCA, International Network for the Conservation of Contemporary Art).

Furthermore, all content partners were encouraged to write case studies about the digitisation of one specific artwork or a group of artworks with the DCA project. The goal of this was to receive material that could enrich deliverable *D4.2 Guidelines for an A-Z digitisation workflow for contemporary art works*. Less than half of the content partners actually wrote a case study. Those case studies that are the most informative (containing information about the whole chain of steps in the digitisation process) are published on the DCA website:

- NIMK/LIMA on the digitisation of a group of video works by the artists Elsa Stansfield and Madelon Hooykaas;
- ARGOS about the digitisation of the documentary film ‘Office Baroque’ (on the creation of the work with the same title by Gordon Matta-Clark);

- FTAPIES on the digitisation of the artist's books by Antoni Tàpies;
- MBVB on the digitisation of the installation 'Vergadertafel' by the artists Axel and Helena van der Kraan.

If PACKED succeeds in enriching some of the other cases studies, they will be published as well.

While writing up the interviews and case studies DCA content providers began to understand that documenting the digitisation process in such way that documentation can be re-used as a stepping stone for future digitisation projects (by their own or other collecting institutions) is specialised and very time-consuming. Creating this documentation was even more hindered by the fact that many of them collaborated with subcontractors who have more digitisation expertise than the museum staff. Sharing this expertise is usually not the subcontractor's priority (since it might strengthen their competitors on the markets or lead to museum staff taking over some of their jobs in the future).

Not all content partners turned out to be good communicators about their experiences during the DCA project, probably due to insecurity or subcontractors carrying out substantial digitisation tasks. The amount of interviews and case studies might be lesser than hoped at some point, but it should be pointed out that no interviews or case studies were planned at the beginning of the DCA project and that the idea only took shape after the mid-term review. We believe that the interviews and case studies available contain very useful information and give a good insight into the DCA project and the digitisation of contemporary artworks and contextual documents.

6. Basis for sustainability of results

6.1. Ingestion of content updates

NTUA has signed the following aggregation agreement with all DCA content partners who used the MINT tool for ingesting their content to *Europeana* (LISTASAFN, RAM, EPMAS, SERRALVES, MRBAB-KMSKB, MAC, MMCA, FRISSIRAS, MU.ZEE):

“NTUA is in charge of physically gathering the data, and commits hereby to process the data contributed by the Content Provider only in the framework of the tasks and activities foreseen by the DCA project, and to only transfer them to the *Europeana* server once they have been authorized to do so by the Project Coordinator. This agreement is not replacing or adding to the obligations NTUA has based on the contract we have signed with DCA and the EU Commission. This agreement is expressing our willingness to do all mentioned in it.

MINT-DCA will be maintained for a year after the end of the project for the providers to transform their data, download or put them online on an OAI (this period may be extended according to the project' sustainability plan). This statement applies to all sub-clauses under 'Terms of the agreement' as follows.

Terms of the agreement:

- *Safety data:* Data are physically stored in NTUA's servers (with periodic backups), accessible only by authenticated administrators.
- *Terms of aggregation:* The *Europeana* Ingestion office defines the harvesting schedule. Typically, metadata from the DCA project will be harvested once per month. After the end of the DCA project, the frequency of *Europeana* harvesting is unclear (possibly frequency per two or three months).
- *Schedule and monitoring:* According to the DCA project time span, DCA metadata will be harvested once per month by *Europeana*. The deadline for metadata last uploading will be the month before the last month of the project (M29). During the last month (M30) of the DCA project, *Europeana* can publish all remaining DCA metadata. It is the content providers' responsibility to perform the mapping and to ingest their metadata to the MINT-DCA in time.
- *Sustainability:* The service will be available for at least a year after the end of DCA. This means that the MINT-DCA could provides its services (upload, mapping, transformation and publication) but the harvesting will be defined by the *Europeana*'s harvesting schedule.
- *Cancellation:* Data addition and deletion is in the providers' complete control. When providers unpublish their metadata, delete a transformation or an import, metadata is withdrawn from MINT (but not necessarily from *Europeana* as the two operate under separate conditions).
- *Costs:* The use of MINT tool after the end of DCA project will remain free of charge.”

6.2. Living document of guidelines

Within the framework of the DCA project several documents were produced from which other stakeholders might benefit. One of the tasks of the project was to share this knowledge in an online publication. Taking into account the rapid technological development and growing experiences in the field of art digitisation, the DCA Project Management Board has decided that the online publication of the DCA project results should be created in the form of a living document, a wiki.

This approach offers several advantages:

1. the information can be revised and updated according to the latest developments in the field of digitisation;
2. it can bring together professionals of the field and create a platform for discussion, questions and answers.

This way the chances will be that the results of the DCA project will have an impact beyond the projects' lifetime and the guidelines published will retain its actuality for a longer period.

The DCA wiki is intended for professionals already working on or considering the digitisation of a contemporary art collection. There are three groups of target users: beginners, experienced professionals and experts.

The core information available on the wiki is based on several deliverables created by DCA. The original text is reshaped according to the wiki needs and restructured to suit as an online guide for all major digitisation issues starting with the planning phase and ending with data preservation and public availability.

The deliverables that form the base of the DCA wiki are:

- *D4.2 Guidelines for an A-Z digitisation workflow for contemporary art works*
- *D3.1 Metadata implementation guidelines for digitised contemporary artworks*
- *D3.2 Recommendations on contextualisation and enrichment of contemporary art*
- *D5.3 Enrichment module and POC*
- *D5.4 Semantic dissemination to Europeana*
- *D6.1 Guidelines for a long time preservation strategy for digital reproductions and metadata*
- *D6.2 Best practices for a digital storage infrastructure for the long-term preservation of digital files*

The information from these deliverables is supplemented and linked with images, case studies, interviews and representations of artwork on *Europeana*. Hyperlinks are used to interconnect related topics within the DCA wiki. The wiki also offers an extensive vocabulary of terms related to the digitisation of contemporary art.

The DCA wiki is created as part of the DCA website (www.dca-project.eu) and forms a new tab in it with a clear reference from the DCA home page.

The discussion pages offer a place for suggestions on changes on particular DCA wiki pages and can be used only by registered users. In order to follow the latest developments on particular wiki pages, a registered user can add a page to a watchlist and enable e-mail notification on changes.

All information on the DCA wiki is available for viewing without registration; however adding changes requires registration that is to be granted by the administrator. If an unwanted change is made, the administrator has the possibility of doing a roll-back to an earlier version. The core text of the DCA wiki has been published by the administrator (DCA/ Packed). Other stakeholders/ contributors are expected to join the wiki community gradually and take an active part in developing its content.

6.3. Socio-economic impact and the wider societal implications of the project

A significant, direct impact of the DCA project is that it makes contemporary art institutions part of the *Europeana* family and contemporary art content of the *Europeana* content. Although this is only a small shift, it is significant because before the DCA project contemporary art was almost completely missing from *Europeana*. If we agree that contemporary art is one of the most important expressions of our post WW2 culture and thus is part of our cultural heritage (now and in the future), contemporary art content should be part of *Europeana*. During the course of the DCA project we learned that making contemporary art content online available may be difficult (due to, for example, the complexity of copyright, the complexity of artworks and a lack of experience in diverse aspects of the broad digitisation process among content partners) but that it is possible. Hopefully the DCA project is only the beginning, and more contemporary art content will find its way to *Europeana*.

What is probably even more important is that the DCA project offered a diverse group of European contemporary art organisations the budget and the framework to collaborate on a large-scale digitisation project, to share experience and knowledge and to learn from each other. Without the financial support of the European Commission this digitisation would never have been possible, although it is necessary to provide access to these valuable collections and in some cases even to preserve them.

Contemporary art institutions like those that participated in the DCA project usually encounter severe difficulties when raising funds for the digitisation of their collections. For some DCA content partners the project was really the start of the digitisation of their collection (or of specific

parts of it). This also means that some had to learn a lot, and quickly. The presence of some more experienced content partners and the technical partners helped them in this. For some content partners the DCA project was even a kind of eye opener; it made them reflect on how to make their collection better available for the public and on their role as a contemporary art institution in the digital age.

If digitisation and online access were still relatively new processes for some DCA content partners, more specific issues such as digital sustainability and open data were new for almost all. And yet these are key issues for the realisation of the European Commission's *Digital Agenda For Europe*. The DCA project contributed to making its consortium and the broader contemporary art field aware of this.

The following facts are also worth pointing out:

1. The European Commission agreed to reimburse 50 % of the costs of the DCA project partners; the project partners funded the other 50 % themselves. This division forced the DCA project partners to take action to raise this additional funding. In many cases such funding came from national, regional or local public authorities but for example in the case of the private museum FRISSIRAS (62,181 euros) and the company UBITEC (33,793 euros) it obviously came from private funding.
2. According to the original Description of Work 466,140 euros of the European Commission's financial support for the DCA project (23,6% of the total requested contribution) had to go to seven partners based in three European countries that are currently hit hardest by the economic crisis: 273,103 euros to five Greek partners, 102,891 to one Portuguese partner and 90,146 euros to a Spanish partner. In this case it is clear that in the current circumstances the digitisation could not have taken place without the support of the European Commission.
3. According to the original Description of Work 850,118 euros had to be spent on subcontracting during the realisation of the DCA project. This money went straight into the economy (usually to small and medium sized enterprises, partly also in Greece, Spain and Portugal). Undoubtedly, all these subcontractors also learned something from this experience which will help to further improve their services in the future to serve the digital needs of our society (for example in the contemporary arts sector). This also has a direct relevance for some DCA partners because they have a long-standing collaboration with some of their subcontractors. According to the Description of Work 114,951 euros also had to be spent on other costs (excl. travel and dissemination costs). This money also went straight into the economy, partly also in Greece, Spain and Portugal (two of the consortium meetings took place in Athens and Porto).
4. According to the original Description of Work 751 PM had to be spent on the realisation of the DCA project. This means more than 62.5 years of work has been spend on the project. This is approximately 2.5 years of work per DCA partner. However, it is not clear yet exactly how many different staff members have worked on the project. If every partner organisation employed 3 staff on the DCA project, this would mean that between

1 January 2011 and 30 June 2013 at least three people worked per project partner (i.e., 75 in total) on average 10 months each on a project that in many cases introduced issues such as digitisation, digital access, digital reuse and digital preservation, and thus contributed to the realisation of the European Commission's *Digital Agenda For Europe*. All such staff members had an income⁴⁰ and gained some essential expertise valuable in the current digital era, which will have a broader impact. The staff members will not only further discuss these (digitisation) issues with their colleagues and others and develop the (digitisation) expertise they have gained, but also further apply it in their professional field.

5. According to the latest figures 39,736 digital master files and 86,518 derived copies, have been created. These will not only serve the preservation of the artworks, but also be available for educational and research purposes. Furthermore, some of them will undoubtedly also be used for purposes that will generate income for the content partners (e.g., video distribution and collection catalogues).

Despite all this, it remains very difficult to estimate the exact socio-economic impact and the wider societal implications of the DCA project. The end of the project is probably also much too early a moment to estimate the impact and implications. It is only at the end of the project that the digitised content becomes available online for *Europeana* and the users. It is also only near the end of the project that the digitised content becomes available for the collection holders for use other than online access. Whatever the full impact and implications will be, it is clear that they will be positive and that they would never have been achieved without the DCA project.

⁴⁰ According to the original Description of Work the total personnel cost was 2,099,491 euros. The actual total cost will only become clear during the financial reporting in the summer of 2013.

7. Dissemination of the project

The dissemination strategy was created at the very beginning of the DCA project and was implemented without significant changes throughout the project's lifetime. Simultaneously new initiatives were taken to improve the communication with target users, taking into account both the suggestions received after the mid-term review and the experience gained while carrying out the project.

7.1. Identification of the target users

In order to organise the dissemination effectively, seven potential user groups were identified:

Group 1	The general public interested in contemporary art, its history, development, artists and their works, exhibitions;
Group 2	The mediators between the general public and artists and their works (curators, art journalists, publishers, media institutions);
Group 3	Users in the educational field (schools, continuing and adult education, teachers / universities, students, professors);
Group 4	Users in the research field (art theory, art history, humanities, psychology, cultural studies, artists, etc.);
Group 5	Professionals in the arts field (staff in museums and other art institutions, guides, archives, art buyers, gallery owners, art therapy, auction houses);
Group 6	Tourism, IT technology, creative industrial or communication design, marketing
Group 7	Policy makers, <i>Europeana</i> & related projects, ICT PSP environment etc.

The beneficiaries of the DCA project could also be roughly divided into three groups, according to their interests:

- One group would potentially be interested mostly in the very digital representation of contemporary art objects and information on them available through *Europeana*. This group would comprise art researchers, critics, curators, artists, designers, tutors, students, professionals from the art market, tour guides, art lovers and general public. Media concerning culture issues was also considered to be a part of this group.
- The second potential user group would (also) be interested in detailed information on the very process of the digitisation, including preservation issues and specific technical questions related to organising and maintaining digital databases. Professionals from art institutions involved in digitisation of their collections or considering it, archive

professionals, digital curators and IT specialists as well as specialised media would form this group.

- The third potential target group would then consist of policy makers, *Europeana* and related projects, ICT PSP environment, that would be interested in the general project management and its socio-economic impact. General public and media were also considered a part of this group.

7.2. General dissemination strategy

Attention was paid to all target groups mentioned, but special attention was focussed on the target groups 2-5. These groups were expected and did act as 'multipliers' of the dissemination activities implemented and helped to spread the information to extensive professional networks and to the general public both in direct and indirect ways.

The 'multiplication' of the dissemination tasks was of special value, as the core dissemination team had limited resources in terms of time, budget, information access and multilingualism. Project partners and target groups communicated the message in their countries, national language groups, national art and culture heritage communities and other appropriate domains beyond the reach of the core dissemination team.

7.3. Dissemination toolkit

To reach the identified target users and disseminate the work-in-progress, experiences gained and the results of the DCA project, a dissemination toolkit was envisaged in the initial dissemination plan, implemented and used actively throughout the project.

The following dissemination tools were used:

- project logo and corporate design;
- PowerPoint presentations;
- project website;
- leaflet.

To strengthen the brand's recognition, a DCA logo and core design of the dissemination tools was presented and accepted already in the kick-off meeting in Brussels on 25 January, 2011. For more detailed information on DCA corporate design please see *D7.1 Dissemination plan*.

In order to help the partners in project dissemination, a PowerPoint presentation template (design) was created. The template could be used to create partners' own presentations. For more general project presentations and those delivered before an international audience, a ready-made PowerPoint presentation was made available to all partners. This presentation

outlined (amongst others) the objectives, work plan, expected results and composition of the DCA consortium in English language.

The DCA project website was one of the core dissemination tools, where all the project related news, deliverables and other significant information was published and updated on regular basis, offering a possibility to download certain documents and follow the projects progress in general. As the project evolved, the website was upgraded by adding special sections for documentation and the possibility to use thumbnail images. As such it was easier to navigate and receive information.

To strengthen the project dissemination activities, an English language leaflet containing general information of the project was created. The leaflets were made available both in print and electronic format, including the possibility to download it from the project website. An electronic format for translation by all consortium members was also available.

To facilitate dissemination and increase its impact, all project deliverables (website, presentations, leaflet, etc.) involving texts were produced in a user-friendly, easily accessible way. For example, the project website was designed according to the guidelines of the Anysurfer label, a Belgian quality mark for accessible websites. The presentation template and leaflet was designed in a similar way.

To make the deliverables as freely shareable and re-usable as possible, they have been released according to a Creative Commons license. All available dissemination material and especially project presentations have been made available in different formats (e.g., not only Windows compliant software, but also in open source formats, such as Open Office).

7.4. Dissemination activities and communication channels

As the interests of projects beneficiaries varied greatly, different approaches and various communication channels had to be used.

To inform the general public and media about the development of the project, several press releases were sent out to national and international media, for example, announcing the project's kick-off and a successful reach of the mid-term. In the mid-term release images of some already digitised artworks were included as well as links to interviews with project partners and case studies published on the DCA project's website. To spread the press releases both central mailing lists (created by all partners) and the individual mailing lists of all partners (also for the translated versions) were used.

Since most of the public deliverables available on the website were intended for professionally interested user groups, several steps were taken to reach this audience directly. The release announcing DCA's reach of the mid-term was sent to professional institutions and networks related to digitisation. A Twitter account of the DCA project was created in which all updates of the website were announced. Publications on such specific platforms as *Digitalmeetsculture* and *Europeana Pro blog* as well as hashtagging *Europeana* on each DCA tweet, brought a significant number of new, professionally orientated DCA Twitter followers.

Several steps were also taken to share the project experience in a less formal and easily digestible way than the very project deliverables:

1. An initiative to organise interviews with several DCA project partners was taken. These were carried out by the project coordinator PACKED and were published on the DCA website along with images illustrating the digitisation process in particular institutions.
2. Drawing on the experience of the DCA content partners, a initiative to create case studies on the digitisation of particular art objects was undertaken towards the end of the project. These DCA case studies were intended to give a deeper insight into possible issues that had to be taken into account when digitising specific types of work.

To increase awareness of the DCA project and inform a non-professional public other steps were taken. Some DCA content partners organised public digitisation, where the usual audience of the art institution was invited to witness the process of digitisation, while other content partners included information on the DCA project in guided tours at their institutions. Numerous interviews on public radio and TV as well as publications in the general press were done by all partners to inform the public of their involvement in DCA.

All partners disseminated the DCA project through their websites. Social network profiles of the consortium partners were also frequently used to share the news from DCA.

The project was actively and constantly presented by its partners at various national and international events, such as conferences on contemporary art and digital cultural heritage, work seminars and art festivals, where there were public presentations, face-to-face dissemination and distribution of promotional materials (leaflets).

To keep the communication alive with other *Europeana* family projects, the DCA project was added to the WP5 mailing list of *Europeana* including the dissemination officers from all related projects. DCA also joined *Europeana* social media channels: Twitter: EuropeanaEU; Facebook group: EuropeanaEU; LinkedIn group *Europeana* and was receiving RSS feeds on *Europeana*. To ensure the DCA content would be traceable when aggregated to *Europeana*, all content partners agreed to use the concise DCA vocabulary.

This will hopefully bring interested persons back to the DCA website which will be kept alive after the project ends and provide extensive information on the digitisation of contemporary art with

the help of the DCA wiki. (See paragraph 6.2 *Living document of guidelines* for more information)

7.5. Monitoring of the dissemination activities

At the beginning of the DCA project a series of indicators was defined that helped to measure the dissemination activities implemented. These showed the expected number of press releases prepared and distributed, the number of guidelines published, of links from other websites, of announcements in the press and other media, as well as the number of meetings with related projects in the *Europeana* group per each year. The indicators were followed during the whole projects' lifetime and the Dissemination Officer monitored the progress.

There were three basic ways to monitor the dissemination activities:

- dissemination of report forms;
- collection of the links, screenshots and articles published on the DCA project in the press, media and other stakeholders;
- monitoring of the website statistics.

The dissemination report forms were to be filled in after each dissemination event, stating the basic information about the event (e.g., who was there, how many people attended, what was presented) and returned by the presenting partner to the Dissemination Officer. The report forms allowed the dissemination officer to monitor the dissemination process and identify gaps as well as unused possibilities.

With the help of project partners the Dissemination Officer collected links, screenshots and articles on a regular basis. As a result an extensive list of all publications and mentions in media was created that helped to monitor the project representation in media.

Monitoring the website statistics with Google analytics helped to analyse the DCA website performance, such as the number of visitors during certain periods of time and their activities. This was taken into account when the website design was upgraded.